THE

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N. B:-Contributors are requested to send in their contributions typed or written legibly in ink on one side of the paper only.—Editor.

Ourselves.

After the christmas holidays both the divisions of the College rejoined their respective camps at Walayar and Mundanthorai. The Seniors spent January at Walayar studying the transition forests and the Pterocarpus Marsupium plantation. The plantation can be regarded as a forerunner of several that will in future be started, for a steady supply of timber. Its value as a suitable wood for gunstocks is now realised and there is little doubt that there is a great future before it.

Instructive engineering works such as the construction of portable bridges and bamboo shoots for sending fuel down steep hill sides were taken up by the students. The shoot was left as it was built, to serve as an example for the contractors who work the fuel coupes.

The Junior Division studied the forests worked under "Coppice with Standards" method. This system has advanced considerably in the Tinnevelly District more than any where else. An excellent system of roads at

Mundanthorai affords convenient means of extraction of uel. The contractor is encouraged and given facilities for forming wide cart tracks of suitable gradient in his coupe which are eventually made into regular roads. The contractor is able to make good profit on his work even after transporting fuel from the Mundanthorai forests as far as Tinnevelly Town by road and rail.

The study of teak, growing under local conditions, formed a valuable object of the tour.

Vengai (Pterocarpas Marsupium) regeneration is prolific in suitable places. It is a soil fertiliser and a valuable timber tree. Seedlings have been further freed in a sample plot chosen in 1917. The species is a light lover and there has been very good response to the tending operations.

The semi-evergreen species, Hopea parviflora, Balanocarpus utilis, Gluta travancorica and others were studied in the evergreen forests of Kodumadi. Improvement operations were conducted by girdling accessory species, to gradually let in more light, to help the regeneration of Hopea and Balanocarpus.

At the edge of the evergreen forest, where the soil is deep and drainage good, teak seeds are being dibbled. The teak plantation at Kariar started in 1907 has become established and thinnings are being carried out.

The combined camp of both the divisions at Sadivayal during February was of interest from all points of view. The growth of trees in these forests warrant the conversion into High Forest and schemes to render this possible were considered.

The Senior Division prepared a Working Plan for these forests for a practical investigation of the subject.

Two trestle bridges were constructed across the Noyal river. Timber and bamboos being available in abundance in these forests this work was more to demonstrate how temporary bridges could be made across streams even for cart traffic with the materials and fibre close at hand.

The Junior Division made charcoal in an overground paraboloid kiln.

The divisions returned to headquarters early in March and have their lectures at headquarters till the 13th of April, when they proceed on the hill tour.

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The compartments of the Demonstration Forest have been laid out on the College Estate with an approximate area of sixty acres. The system of working has been fixed upon. The area is being surveyed and demarcated in order to start actual working of the Forest in the near future.

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Physical Culture is not neglected at the College. While on tour every facility is afforded for outdoor exercises.

A bathing pool was provided at Sadivayal by partially bunding the Noyal river, to give opportunity for the non-swimmers to learn swimming. The Marathon race was the chief athletic event of the tour.

Our activities in games are detailed in a separate contribution.

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We beg to acknowledge with gratitude the very kind present of a Challenge Cup for the Marathon race by Rissaldar Major Bahadur Amir Mahomed Khan (late XX Deccan Horse). The cup is to be held annually by the

Winning Division (the first 10 men in each Division count). The students appreciate the gift which has enhanced the keenness in competition for the race.

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As "Journal" has a special technical application at the College, the Board of Management has decided to change the name from "Madras Forest College Journal" to "Madras Forest College Magazine."

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We wish to bring to the notice of our subscribers and to all the Ranger Class (including Deputy Rangers) in general that this Magazine was started for the benefit of the Ranger Class and will have to be conducted by that class almost exclusively.

The Magazine is not being adequately supported in literary contributions by those of us for whose special benefit it was called into being.

The primary object of this Magazine is to provide Rangers (including Deputy Rangers and literate Foresters) with the means of exchanging ideas on the various subjects which interest them and in particular those subjects which come into their everyday life.

To those Rangers who have been trained at the College, the Magazine should have a special value. It was the 1914—16 division that started the idea of a journal. After a good deal of opposition the journal came into being in 1917 and has been carried on up to date principally by the Members of the Staff of the Magazine. Very few contributions have come from the old students of the College, though frequent appeals have been made for suitable articles. It may be mentioned without offence that students while leaving the college after the completion of the course readily promise to contribute to the journal but manage to as quickly forget all about it. There is such a large variety of subjects one could write on usefully and yet so few seem to be sufficiently interested in the Magazine. Interest in the Magazine and a due appreciation of it to be worth anything must go so far as to contribute to it.

To send ones fees and subscriptions annually and then to think no more about it is exactly the treatment unsympathetic people usually accord to a subscription list for some charitable purpose.

It has now come to this, that unless contributions came in adequately from the Ranger Class of the Presidency (including students at the College) the Magazine will be discontinued. The opportunity of having a paper exclusively for the executive staff to discuss what interests them would thus be lost for all time.

The Magazine was founded *for* the Ranger Class to be conducted *by* the Ranger Class, and we have authority for stating that it will *not* be conducted by the Principal and Staff of the College for the benefit of people too lethargic to show an adequate response to the efforts made to convert them from raw material into a finished Ranger, with an assured position and good prospects.

We can imagine our readers giving an emphatic " No " in reply to the question " Is our Magazine to become defunct "?. We settle ourselves down in the office chair with confidence, awaiting arrival of manuscripts for the next issue.

Our subscribers, the past students in particular, can render valuable assistance to the Magazine in another direction. We have a little over two hundred subscribers on our lists, while there are at least twice that number in executive service who can become subscribers. It ought to be the duty, if it is not expecting too much, for every subscriber to at least get one additional subscriber. Our financial condition has already been published. We are at present issuing copies below cost price. Several interesting illustrations (photographs and drawings) are kept back from publication for want of funds. In this connection we have to note with regret that a few past students have so far forgotten the essentials of their training as to fail to accept the Magazine when it was sent to them after having undertaken to subscribe to it.

Forestry as a Profession for Young Men.

An article under the above heading which appeared in the American "Forestry", November 1917 issue, has induced me to take an extract from it as it applies equally to Madras. My hope is that the readers will not fail to be impressed by it and will make it their business to popularise Forestry as a science in a country where many people still think that forests are no man's land and the busy men of towns have little notion of what Forestry is.

The war must have opened the eyes of all people to the demands of various kinds of forest produce. Very interesting facts regarding the necessity for and the extensive use of wood must have brought home to the minds of our people the importance of the forest and its proper care. We learn that wood is not merely used for house construction, fuel, telegraph poles and pulp for paper, but, even in this age of steel and cement, enormous quantities of wood are required for ships and camps, for railways and also for æroplanes. Beyond this, wood is now made into clothing, bedding, fibre for shoe-soles where such industries are possible. Further, sugar, alcohal and vinegar are being made out of wood.

Not only to meet the demand, but to provide oursleves with requisite material we must grow the right kind of forest crop and use the soil to its full capacity.

One has to realise that the food, clothing and housing materials are products of the soil; land, labour and time are needed for their production and especially the forest crop needs a long time—a century or more to produce timber for instance, fit for a definite purpose.

The care of one of the largest crops of the land, the planning for produce to be realised a century hence requires better capacities than those of a mere wood cutter and necessitates a policy which has a continuity.

It is said that thirty years ago Forestry was not yet known in the American dictionary and that there were then no trained foresters. To day, millions of acres of natural forest land bear a forest crop under more or less organised management.

In Madras the work of the Forest Department, so far, has been to protect and improve the forests to bring them to the present condition. It is now time to concentrate operations and to apply permanent methods of treatment, to produce, later on, materials to meet demands of all kinds.

What a great field this offers for the young men in choosing a profession. On the Continent and in America tens of thousands of foresters and assistants and labour are required for forest work. Madras will need several hundreds at least in the near future. Private and States forests have also to be taken into consideration.

Schools and Colleges to train foresters are being started in the several provinces and states. A forester will prove himself a public servant of the highest order and value.

A forester's life is one of the finest that any enterprising, hardy man can desire; work and hardships mingle with leisure and freedom, and to this is added variety in work and variety in place, the out-of-doors and a clean and beautiful environment. His work is not of the nature of a clerk. He deals with large things, thousands of acres of land and a large supply of forest produce. The salary of a forester is good. The forester fares well and is even better than the teacher, doctor, lawyer etc. and is able to earn after a few years' experience what a good teacher will earn after long years of drudgery.

The course of study which the forester pursues comprises, in science—mathematics, physics, chemistry, geology and botany—, surveying, including map making and Engineering, besides courses in forestry proper. A student who takes a forestry course is far more certain of a useful, well balanced science course than is the student who trusts his own immature judgment and the enthusiastic pleadings of the various specialist teachers. The course will prove useful for works in other lines besides forestry: e. g., General Estate Management, Planting etc.

The field is immense, interesting and enjoyable in character and appreciative in its pay. We need foresters and we *shall* have systematically managed forests.

Editor.

The French Rangers' College.

At Les Barres near Nogent-sur Vernisson (between Paris and Dijon) is situated the establishment where the French Provincial Forest Officers and Rangers receive their professional training.

As at Dehra the two classes of students are kept entirely apart as regards residence and course of instruction, and are under the control of a single Director who ranks rather above a Conservator.

The staff consists of, besides the Director, a Deputy Director, four outside Professors, one Officer of the Army for military training, a Ranger, and two Havildars.

Eighteen students belong to the Extra Assistant Conservator's class, while the Ranger's class numbers twenty one. The course for the Provincial Service is two years, for the Ranger's class one year. Thus, every year 9 students for the former and 21 for the latter are admitted. Nearly every student for the Extra Assistant Conservator's class has already passed through the Ranger's course and has also served for some years as a Ranger. The Ranger's class is recruited from Forest Guards of approved service. (There is no Forester's or Deputy Ranger's grade in France). In the Provincial Service school, the course is naturally more theoretical and less practical than at the Ranger's school. Colonial and private students are also occasionally admitted.

The two schools are situated on the same Estate—about 150 acres in extent—which is admirably suited for the object in view : i. e., practical training in Sylviculture and Forest Botany. The greater part of the area is covered with compact blocks of conifers and broad leaves (indigenous and exotic), pure and mixed, even and uneven aged, and of all stages of growth. Thanks to the fertility of the rich sandy loam, an exceptional height and girth increment is the rule. Close by, are the arboretum and nurseries, admirably arranged, and of the greatest instructional value. In one of the nurseries each student of the secondary school has his own plot, bearing his name. A keen and healthy competition naturally results. The same plan is about to be adopted in the Madras Forest College.

Each tree in the arboretum is labelled, as are also many of the blocks on the estate. The grounds are common to the two schools and present a sylvicultural charm that, within the writer's knowledge, rivalled only by the surroundings of the Italian Forest College at Vallombrosa.

At both schools the time-table and code of discipline are very similar.

Students are called at 5 A. M. in summer; 5-30 A. M. in winter. Roll-call is taken half an hour later. The sleeping and living-rooms are then throughly swept out and cleaned by the students themselves. A few servants are maintained for the menial offices, but the greater part of the domestic duties are borne by the students. The messes are run by a committee of students presided over by an instructor.

The head of each year called the Major has special responsibilities. There is also a house committee of similar constitution and functions to that of the Madras Forest College.

Lectures and practical work commence at 8 A. M. and last, with short breaks and an interval of one and a half hours for dinner, till 6 P. M.

All calls are sounded on a forest horn. The last call (bed-time) is sounded at 8-30 in winter and at 9 in summer. Half an hour later, all lights are extinguished.

The strictest discipline is maintained as regards salutes, standing at attention, silence in the lecture-rooms, and an absence of noise in the passages etc.

All kit is arranged on a definite plan. Questions may not be asked during lectures. The order of a superior may not be discussed at the time of its issue, but must be obeyed instantly.

Combined or collective complaints are forbidden; all such must come through the house committee.

The office is out of bounds.

Students must always be in uniform; civilian dress is forbidden, as are also the presence of the other sex, or the introduction of private arms or of dogs, within the schools.

Married men or widowers with children are allowed to live at their own expense in Nogent-sur-Vernisson, but they have to be present at the first parade like the resident students.

Playing cards is forbidden. Public balls or wine parties may not be attended. A student from the one school may not invite a student from the adjoining institution.

Sunday is a free day from 7-30 A. M. till 9-30 P. M. in winter and 10-30 P. M. in summer.

Education and lodging are entirely free. Messing is paid for by the students, the large majority of whom are drawing Government pay.

Punishments are extremely rare. They are similar to those in force at the Madras Forest College. Money fines are not imposed. Expulsion, which may only be inflicted by the Director General of Forests, is practically unheard of. There is no provision for appeals against the decision of the Director of the schools.

Course of students: *Rangers' school*:—The course is somewhat more advanced than that of the Madras Forest College, though the subjects are very similar. Entomology, chemistry, geology and mineralogy (formerly subjects at the Madras Forest College) are not taught, but lectures are given on game, preservation and pisciculture, while the Law-course is rather extensive.

During the ten months of the school year the time is divided as follows:—

195 lectures of 1½ hours;
15 days' touring;
70 half-days of manual forest work;
70 half-days of survey (including plates);
60 periods 1½ hours, devoted to miltary work.

The following is a rough distribution of the in-door work:—

Forest botany, sylviculture and working plans, exploitation, 30 lectures.
Law, forest rights and procedure, 30 lectures.
Arithmetic and geometry, 25 lectures.
Survey, 20 lectures.
Fixing of unstable soils, 20 lectures.
Game and its protection, 5 lectures.
Pisciculture, 5 lectures.

The French language, spelling and composition, 60 lectures.

The students are marked for their work throughout the year, but there are no final examinations. Those who obtain the required minimum, pass out of the school as rangers.

Provincial Service School:—The subjoined table gives the subjects and numbers of lectures in each.

Subject.	First year. *Lectures.*	Second year. *Lectures.*
Sylviculture	30	....
Working Plans	....	30
Reboisement and dunes	....	25
Law and Procedure	30	30
Botany	25	25
Zoology: pisciculture	....	25

Mineralogy : geology	10	....
Geometry	50	....
Algebra	35	....
Trigonometry : solid geometry	20	....
Survey	40	10
Engineering & correction of torrents	....	55
Physics	....	25
Inorganic chemistry	15	....
Agriculture and cultivation of pasture	....	20
French language and literature	30	30
Military science	20	30
Total....	305	305

The comparative value of each subject in the oral, practical and written examinations, is as follows :—

	Marks.
Forest sciences	16
Law and procedure	12
Natural science	12.5
Mathematics pure	5.5
,, applied	13
Inorganic chemistry	1
Drawing and Survey	3
Agriculture	2
French language	8
Military science	5
Conduct, discipline	3

The examinations, held once a year, are oral, written and practical. The minima for passing are : totals, 50 per cent ; forest sciences, and applied mathematics, 30 per cent; other subjects 20 per cent. A certificate of merit in military service must also be obtained.

A student failing to qualify, or who has been absent from illness for more than one month, is permitted to repeat one year. In no case may a student stay for more than three years of the school.

On the whole, the cource is more advanced than that for the provincial service at Dehra Dun. The relative importance attached to law and mathematics at Les Barres is remarkable.

A senior student remarked to the writer that the school cource was too theoretical. This criticism seems justified by the fact that advantage is not taken of the splendid estate to practise the students in cleanings, improvement fellings and thinnings, nor in forest engineering. In fact, the home forest is not subjected to sylvicultural operations, and the roads are constructed and maintained by outside agency. Want of time was the curious reason professed for the omission to profit by the excellent opportunity for practical work afforded by the environment.

Taken as a whole, the forest schools at Les Barres are admirably organised institutions and as such, are of the greatest service to the French forests and therefore to the French people.

Regular touring is not undertaken, but visits are periodically paid to the State Forests of Montargis and Fontaineblean easily accessible by railway.

No provision is made for Athletics, nor with the very full daily time-table prescribed is there any scope for them. The annual vacation lasts for two months.

In appearance and size the buildings cannot compete with those of the Dehra Research Institute or of the Madras Forest College, but are nevertheless well adapted for the end in view.

All the French Forest Schools are remarkable for an entire absence of external architectural embellishments.

They not undeservedly claim that their chief title to attractiveness is based on the renown of their professional reputation.

On the whole students at Les Barres have longer hours, harder work, less leisure, and less comfort than is the case at the Madras Forest College. On the other hand they enjoy a long vacation and their touring is confined to excursions for the day.

It will perhaps be of interest to add a few notes on the general administration of the French Forest Department.

The service consists of

1 Director-General at Paris under the Minister of Agriculture. In rank he corresponds to a Secretary to Government in India.

2 Inspectors-General also at Paris.

Gazetted officers.

32 Conservators (including two Directors of schools, who have no territorial charge-one for Les Barres, and one for Nancy where the higher officers are trained).

200 Deputy Conservators.

430 Assistant Conservators, Extra Deputy Conservators and Extra Assistant Conservators.

1,050 Rangers and 2,575 Forest Guards (including those of both these classes who are partly in charge of communal forests).

There are no watchers.

The area directly and absolutely under the control of the Forest Department consists of 4,860 square miles of reserved forest. In addition, there are 7,800 square miles of communal forests administered by the Civil authorities. In many cases the subordinates of the communal forests are State forest guards in charge of both classes of forests.

The Civil authorities controlling communal forests are bound to consult the Conservator in all important matters, such as the felling of coupes, fire protection etc. If the Conservator's advice is not accepted, the Collector as the head of the Civil Administration, must refer the question to his superiors.

All private forests in France (some 23,000 square miles) are also, to a limited degree under the control of the Forest Department. For example, the Conservator can forbid all felling on unstable mountain slopes, and does prohibit all grazing over such areas. He can also insist on the establishment of an adequate system of the fire protection in any private forest.

In cases of serious fires, the Collector can, at the request of the Conservator, call upon the General of the Division to furnish troops to assist in extinguishing the conflagration.

The entry of goats into reserved forests is absolutely prohibited, and the pasturing of other animals is greatly discouraged and restricted.

The reserved forests are, for the most part, normal: the result of 350 years of more or less regular management, dating from the law of Tire et Aire, promulgated by Louis XIV in 1669. Under that regulation, on every acre under coppice, sixteen trees were to be reserved as seed-bearers; on every acre under high forest, eight trees were to be retained for the same purpose. The rotation for coppice was fixed at forty years in all private forests; the revolution for high forests was fixed at one hundred and twenty years. In all State forests, reserved coupes were instituted and the pasturing of goats and sheep prohibited.

France, Corsica and Algeria are, for administrative purposes regarded as one and are divided into 32 circles.

The French colonies proper (e. g. Cochin China have) their own separate personnel.

The two Inspectors-General are mainly concerned with inspection duties. They have no territorial charges but, with the Director-General and the Conservators on the staff at Paris, form the Administrative Council of the Forest Department.

A Conservator's circle roughly consists of 150 square miles of reserved forest; a division (controlled by a Deputy Conservator or an Extra Deputy or Assistant Conservator, assisted by an Extra Assistant Conservator, 20 square miles; a range in charge of an Extra Assistant Conservator or Ranger) about four square miles, and a beat 1·7 square miles. But as already explained, the officers may also have surveillance over the neighbouring communal and even private forests.

Twelve special divisions, with a staff of 30 gazetted officers, are devoted solely to working plans and re-afforestation. The very large number of sedentary posts sanctioned both in Paris and at each Conservator's headquarters afford ample opportunity for the recruitment of shattered health or jaded nerves, a provision that must add materially to the popularity of the service.

The work of the forest officers is entirely professional; all account matters are controlled by a special branch of the State Service, and almost all exploitation is effected by contractors.

The annual revenue of the Department amounts to £1,372,000 the expenditure £638,000. This includes £129,000 spent on the restoration and conservation of mountain tracts (producing practically no revenue) and £ 44,840 devoted to roads, buildings, fixing of dunes, fire protection, and general improvement of the State forests.

The average annual yield per acre of the reserved forests is calculated at five rupees or forty cubic feet.

Fire Lines.

At the time of year at which this is written the attention of the majority of Forest Officers is very largely devoted to the problem of fire protection, and it must occur to many that the results achieved are ordinarily hardly commensurate with the trouble and expense involved. Fire lines will not prevent the occurrence of fires. With that side of the problem this note will not deal; it is only intended to discuss the utility of the steps now taken, by fire lines, to check the spread of fire and to limit the areas burnt, in the hope that the matter may be subjected to constructive criticism by those who should be best qualified to offer an opinion, i. e., Range Officers who have direct control of the work.

It is not a common thing to see a fire line which could, with confidence, be expected to stop a fire: many, as at present executed, would hardly afford a safe line from which to counterfire, while in very many cases the burning is undertaken so late that the forest is exposed to the gravest danger by the very act which is supposed to afford a means of protection.

What is required is that the fire lines should be cleared and burnt, and put into such a condition that no fire can cross them, before the forest is liable to damage from fire. This is the ideal, and if a fire line is not perfect it is of little use. The date by which the fire lines should be completed naturally varies in different localities and according to the season, but preparation can hardly be commenced too early. It is quite common to find that guide line clearing is not commenced until the fire season is upon us, and that the actual burning of the fire lines goes on concurrent with, and is often a cause of, the firing of the forest. In the forest which the writer of this note has in mind, guide line cutting is commenced in Novr. 1st. (arguments that so early a commencement results in the cut grass coming up again are met by the fact that the grass that comes up is green and that it attains no height) and was completed in January. The earlier the lines can be burnt the better, but here the difficulty begins—the lines will not burn, the dry material from the guide lines is insufficient to burn the green grass in the central belt and a clean burn seems impossible. The difficulty is further increased in the case of "Closed" lines (i. e. those on which the trees have not been cut) where clearly the line will not burn until the forest will burn. It is not desired to provoke controversy on the subject of "closed" and "open" lines; there are many "closed" lines and it is desirable to consider the problem of how to burn them. The case of "open" lines is more simple, on them the grass will dry more quickly than that under shade in the forest, but even in the case of these lines it is often not possible to burn so early as is desirable. Another point is that the grass on fire lines is ordinarily less flammable than that in the forest (if the latter has escaped fire in the preceeding season) for, if the fire line was burnt previously, the grass on it will not contain the dry stalks and other material which accumulates in the unburnt surroundings. Again grass in which it is difficult to start a fire will burn fast enough when a fire is once started, which fire, travelling perhaps down a strong wind, scorches the grass ahead of it rendering this material inflammable, and burning over the prepared line which was found impossible to burn with the ordinary precautions.

Granted that they have been prepared in time there is very real difficulty in burning fire lines as early as is desirable. Some of the reasons have been indicated, how is the problem to be solved? A great deal can be done by seeing that all the weeds, woody growth and similar small stuff is cut back in the central belt when the guide line clearing is done, by seeing that all the material cut from the guide and ladder lines is scattered over the central belt, and by beating the grass in the central belt with split (i. e. sharp edged) bamboos, so as to reduce the height of the grass and consequently the danger when burning is undertaken, and to provide inflammable material from the pieces of grass so cut. The last operation is in the nature of a compromise: it would be infinitely better to cut all the grass over the total width of the line, but the cost of so doing would be considerable, whereas the operation suggested is cheap, and should be effective enough.

Further if it is necessary to burn twice or even three times it must be done, though second burnings are difficult and rather costly. The belief that patrols (how often they are appointed for lines which have never been burnt at all) will attend to reburning and to the pruning of unburnt patches is a most dangerous one.

The first criticism which will be levelled against what has been written is that it cannot be done for the amount of money available, and in some cases this will be a very just criticism. If an expenditure of twelve annas will not attain an object it is desired to achieve, we clearly waste precisely twelve annas by spending that sum, and it is probably better to spend a rupee if by so doing the object sought is attained. A fire line to be any use must be perfect.

Other points which occur to one in a consideration of fire protection are that so often more is attempted than can be done effectively; insufficient width of lines; lines run over inaccessible country and there are no made paths by which they can be reached; facilities are not afforded for the labour to halt where it is engaged, hours and energy are wasted daily in walking to the work; guide line cutting and burning are supervised by irresponsible persons or not at all; other works are in arrears and the Ranger is unable to give his whole time to his most difficult, but largely neglected, problem. If it is decided that fire protection is desirable let us tackle it thoroughly, half measures are of no avail. If this note is successful in producing comment and suggestions from those who are most intimately connected with this very real problem much should be gained.

R. D. R.

Note.—We welcome discussion of this interesting article. Three points stand out in the recollection of probably nearly all of us:

i. Line cutting is often commenced far too late;

ii. A large proportion of Forest Fires is due to accidents in burning the fire lines (the burning having been started so late in the season that the operation itself becomes dangerous to the very forest that it is intended to protect):

iii. Naturally bare lines (e. g. rock) find their way into—and annually retain their place in—estimates for "clearing and burning."

Editor.

The Madras Exhibition of Indian Arts and Industries (1917–18) with special reference to the Forest Section.

Great as was the number of visitors for the Exhibition held recently, there were many, who, for some reason or other, were unable to pay a visit; to the edification of such people in general, and those interested in Forestry and allied subjects in particular, the following stray notes are published.

Due to the initiative of H. E. Lord Pentland an Exhibition of Indian Arts and Industries was held in Madras in December 1915; this was followed by the recent one of December 1917; perhaps the best yet seen in the Presidency. Though the interval between the two shows was not long, no justification is necessary in a country like India, where industrial literature is practically non-existent, so far as it relates to local manufactures etc., and where "Ocular demonstration and oral explanation" are consequently of decided advantage and even a necessity; furthermore, India under the stimulus of the present war is taking rapid strides in her Industrial development and has been, or is, on the look out for the best substitutes for a large variety of her imported articles, which as a result of the war have either become prohibitively costly, or of which the importation is likely to cease. Exhibitions in India cannot, therefore, be called stereotyped, and the late one was not a repetition of its predecessor. No doubt the industries of the Presidency are, for the most part, in their infancy, but from the recent exhibition it may be assumed that the Madras Presidency is striving to efface the stigma implied in Sir Thomas Holland's remarks that 'Madras with its wealth in raw materials has found it easier to buy than to manufacture the articles required for the amenities of life.'

The 1917–18 exhibition was different from the previous one in having been an 'All-India Exhibition' i. e., exhibits were sent from such distant states as Patiala. The opening of it by the Viceroy of India attracted a large number of visitors, especially to the opening ceremony, admission to which was gained by silver passes of Rs. 15.

The building was twice as big as the one of 1915; the grand gateway and the front aspect were after a Pathan fort of Pre-Moghul architecture and really very imposing. The exhibition space was 42,600 sq. ft. with verandahs and passages, and contained 144 stalls. Of these, points of special interest in the more important stalls will be briefly mentioned.

1. *Salt and Abkari Department, Madras*:—

Chief among the exhibits were Madras table salt, epsom salt, salt-petre etc. Of these, table salt is worthy of special mention. At the present time, Madras table salt can be made for 1 anna and a quarter per pound as against 3 annas per pound, the current price of imported salt. Being much cheaper and the dirt in it only 0·12% more than in the imported salt, Madras table salt, will prove an efficient substitute for its foreign competitor. The manufacture of salt for the masses is still capable of enormous development. The price of table salt has trebled during the last three years, and the department can view with legitimate pride its success in producing table salt nearly as good as, and much cheaper than, the imported article.

2. *Parry and Co., Madras*:—

Messrs. Parry & Co., exhibited products manufactured by the following companies under their management.

The New Malabar Timber Yards and Saw Mills, Ltd., situated at Kallai, exhibited samples of cordite cases, and various casks etc., manufactured by them; but it was a pity that the names of the different timbers used were not noted on the exhibits, nor was the Officer in charge there, able to give them.

The Presidency Manure Works Ltd., exhibited a large number of organic and inorganic fertilizers both imported and made locally at their works at Ranipet.

3. *The Government Pencil Factory Madras*:—

In this stall were exhibited raw materials and samples showing various stages of pencil manufacture in Madras, and also exhibits of experimental pencils made of Indian woods. All attempts to find a ready satisfactory substitute for the pencil cedar have however failed. Over 80 Indian woods[*] were experimented and sample of these exhibited. Tetrameles nudiflora and Gyrocarpus Jacquini were found technically suitable but not attractive enough. Better woods have been discovered, and pencils made of these would probably command a limited sale, but for the present, it would seem necessary to rely mainly on cedar (Juniperus procera) imported from East Africa. Pencil factories in Europe depend mainly on imported cedar and imported graphites.

There were also exhibited the several stages in the manufacture of brown paper from bamboo pulp, made at the Punalur paper mills:—Green bamboo chips.

Chopped „ „
Bamboo pulp from the breaking engine
„ „ beating „
„ „ coloured.

4. *Village and Mission Industries*:

Among the exhibits were metal mirrors manufactured in the Krishna district, which proved that the secret of manufacturing these is no longer confined to a particular family in the Travancore State, as was believed hitherto.

5. *Indian Munitions Board*:

This was one of the most instructive of all the stalls, demonstrating by its exhibits how India is striving to become less and less dependent on imported articles.

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[*] Chief among these were :

Cedrela Toona,
Melia composita,
Trewia nudiflore,
Holigarna Arnottiana,

Gmelina arborea,
Boswellia serrata,

Sterculia urens,
Ailanthus excelsa,
Lophopetalum,
Wightianum,

Phyllanthus Emblica,

The Chemical section showed various chemicals prepared in India. The Indian Institute of Science Bangalore, has an excellent representation of the work done there. It has shown how some industries can be profitably taken up in India, and some, yet in their infancy, developed further. The extraction of sandalwood oil is a striking case in point. After the out break of War there was a considerable reduction in the export of sandalwood from South India, and distillèries were established in Mysore, which, due to the work of Dr. Sudborough of the Indian Institute of Science, turned out oil as good as any previously produced elsewhere.

Next were exhibited the preparation of thymol from Ajwan seeds (Carium copticum) in all its different processes. The crystals were as good as the imported ones.

There were, again, exhibits suggesting new developments in the use of Indian timber for military purposes such as in the construction of aeroplanes and ships. In connection with air-craft efficient Indian substitutes were shown for the commonly used European timbers—spruce, ash, walnut. The substitutes for ash, tried and suggested are : Grewia tiliæfolia (found to be twice as strong as ash).

Acrocarpus fraxinifolius,
Holoptelea integrifolia,
Moras laevigata,

Those for walnut are :

Lagerstrœmia Flos-Reginæ.
Albizzia procera and a few others.

It was also shown how the war and the rise in the price of iron may lead to the revival of the old industry of wooden ship building in India.

There was also displayed, an array of glass articles and apparatus manufactured by the " Scientific Instrument Co."

Allahabad, and the 'Indian Glass Manufacturing Company' of Bombay, most of the apparatus being maiden attempts in India since the outbreak of war.

6. *The Madras Forest Department.*

The Madras Forest department had its share in the exhibition as before, but the exhibits and the arrangement were somewhat different from those previously adopted. The main idea this time was to emphasise the timber resources of the Presidency, and launch a scheme of commercial categorization of Madras timbers, such as would, in a way, virtually increase the abundance of the popular and more costly timber species of the Presidency. The principle of the project which originated from Mr. A. W. Lushington, C. I. E. is briefly as follows :—

Owing to the increasing demand for timber in the country and abroad, it would be desirable to increase the abundance of species in demand, and avoid that 'abuse'—so to speak—of the more costly timber species, such as teak, which prevails in India, where teak is used more commonly and liberally than is advisable and necessary. An easy way would be to find substitutes cheaper than and nearly as good as the species in demand. Clubbing together species which approximate one another in hardness, colour, weight, transverse strength and other such important properties, the whole of our 472 species (capable of attaining 1 ft. or more in diameter) can be aggregated into 64 categories. In that way, the multiplicity of species, and the resulting confusion in nomenclature can, to some extent, be avoided, making it easier for the commercial community to recognise the various species of timbers suited for a particular class of work. Further, this clubbing of a number of similar species into one commercial group is justifiable, when we realise that though the quality of a single species in Europe is often exceedingly variable all the grades of one and the same species are sold as of one quality. It is also a common practice in introducing a new species, to name it with that of some similar thing already on the market, tacked on to it.

Based on the above principle, the timber specimens were divided into four main categories, ranging from Cochlospermum gossypium to Hardwickia binata :—

I. Mostly soft to very soft woods (Consisting of 15 categories)
II. ,, moderately hard woods (,, 20 ,,)
III. ,, hard woods (,, 21 ,,)
IV. Very or extremely hard woods (,, 8 ,,)

It is neither possible nor necessary to describe the 64 categories, as details of these will be found in Mr. A. W. Lushington's book on "Madras Timbers" recently published and sold, in connection with the Madras Exhibition. The scheme was appreciated by many educated people of the commercial class, and pronounced as a move in the proper direction. It was, however, suggested it would be better, from a commercial point of view, to call such groups as "False walnuts" and "False elms," 'Madras walnuts' and 'Madras elms.'

Some interesting points on the timber exhibits may be given here. Under utilization of Sterculia villosa and Givotia rottleriformis were exhibited cigar boxes made of these woods, which attracted the attention of the commercial public to such a degree that enquiries poured in, about the available quantity per annum, and the habitats of these woods. Melia composita drew the attention of some firms who were anxious to know whether it could be obtained in quantity for making packing cases. They were also hankering after such species as Carallia integerrima, Lophopetalum Wightanum, Evodia Roxburghiana, Gluta travancorica, Lansium anamalayanum for cabinet work. The last is recommended, under the scheme, as an efficient substitute for satin wood. Vitex altissima and Premna tomentosa can very well take the place of teak wherever possible. A longitudinal section of Gnetum scandens a common liane of the Western Ghats showed how attractive the wood is and could be profitably used for making small fancy articles instead of its being abused as material for fuel.

In addition to timber, there were exhibited other products such as oils, gums, resins, fibres, paper pulp from Lantana and Helicteres and tanstuffs. The gums were classified into *adhesive gums* such as Acacia arabica, Anogeissus latifolia, and *hoggums* such as Odina Wodier, Bombax malabaricum. The resins were likewise separated into *true resins* such as Shorea robusta, Vateria indica and *gum resins* such as Engenia gardneri. Tanstuffs were exhibited along with very interesting notes on these, prepared by P. M. Lushington Esq., and published in the "Official guide and descriptive Catalogue of the Exhibition."

Last but not least must be mentioned, the charcoal briquettes prepared by Mr. Pearson, Imperial Forest Economist, Dehra Dun. These were prepared from powdered charcoal agglutinised with the gum of Bauhinia retusa, and pressed under hydraulic pressure. They are reported to possess a higher calorific power than Indian coal. The particular gum Bauhinia retusa is preferable to others yet known, as it has a high adhesive power and burns with a clear flame. It is however not abundant enough, and a satisfactory substitute is, therefore, being tried. The juice of prickly pear along with some other substances have been suggested and are being tried.

Mention must also be made of the 'sale sub-section' of the Forest Department, run by the Forest Assistant. A large variety of minor forest products was sold, the sale proceeds amounting to a good round sum of Rs. 2,000. The profits go to the War Fund. "Naga Canes" as usual found a ready market, selling at Re. 1 each. The demand for this was mainly based on the belief that it invariably wards off snakes, especially cobras. A pair of elephant tusks weighing 50 lbs sold for Rs. 500. In this connection it may be remarked that a pair weighing 150 lbs was sold at the Travancore stall for Rs. 1500! Walking sticks made of Chloroxylon Swietenia, Hardwickia binata, Dalbergia latifolia, and Acacia Sundra were sold in large numbers.

7. *The Agricultural Department.*

An interesting and novel feature of this stall was the display of children's patent foods, prepared, for the first time, by the staff of the Chemistry Section of the Agricultural College and Research Institute, Coimbatore, from indigenous cereals such as cholam and ragi in the place of wheat, barley and other such cereals of the West, from which most of the imported foods are made. These foods prepared locally, were nearly as goods as, and much cheaper than, the foreign ones. For this exhibit the section has won a well deserving gold medal.

The department also demonstrated by means of nursery plots with growing paddy crops, that by sowing, so as to furnish plants for transplantation of single seedlings instead of the traditional bunch transplantation, there is a saving of 30 measures for an acre, or 19,200 measures for a square mile of cultivation. Such demonstrations would certainly induce the ryot to do away with the traditional and conventional methods and adopt modern ones.

Daincha (Sesbania aculeata) was grown near the paddy plots and advocated as an excellent green manure.

8. *The United Planters' Association* :—

Tea of all sorts, and some spices were on show in this stall. There was, among the trophies exhibited, the skin of what is said to be a record panther.

9. *The Patiala State* exhibited excellent lace, and some Forest Produce; matches made from the woods Erythrina suberosa and Bombax malabaricum, and pencils of Holigarna Arnottiana, Gmelina arborea, and other woods were of special interest.

10. *Other Stalls*: There were also very interesting exhibits contributed, among others, by the states of Travancore, Cochin, Pudukottah, Banganapalle. The South Indian Railway Company exhibited a working modal of the rolling lift-bridge over the Pamban pass, the viaduct between India and the island of Rameswaram on the Ceylon-Indian Railway line; the Electric Supply Corporation, a model Tram car with 'first class' accomodation fitted with electric lights and fans,—a model which the company hopes to follow in the near future.

As already prefaced, this account does not claim to be exhaustive and therefore can only give a very inadequate idea of the various phases of the Exhibition too numerous to be dealt with here.

G. Viswanatham.

Forest Offences.

Short as my experience as a Range Officer is to warrant an article from me on this subject, I feel justified in writing one because the chief aim of this magazine—conducted by Rangers for Rangers—is the free exchange of ideas and opinions among the Madras Rangers. One cannot shut one's eyes to the fact that, at present, the subordinate magistrates, at any rate, are apt to overlook the prosecuting Range Officer's lack of knowledge of Law and being Government Officers themselves take upon themselves the duty of eliciting the omitted facts from the prosecution witnesses. But when in certain cases the accused are defended by vakils, among whom there are a few at least who attempt to baffle even the magistrate not to talk of the poor Range Officer, then the Range Officer finds that in every step of his in the course of the trial there is a rebuff from the opposing vakil to combat with. Inexperienced Range Officers, as also others who have not improved their knowledge of Law and Procedure in conducting forest cases, find their position awkward in such circumstances and true cases are lost in the court. A large number of cases under the column "*cases acquitted*" in Form 71 of the Annual Administration Report indicates something rotten in the state of Denmark and seems to reflect on the Range Officers concerned.

The Range Officer has, at first, to be thoroughly conversant with his own departmental orders, the District Forest Officer's, Conservator's and District Magistrate's Standing orders and other circulars. I will quote but two instances of lack of interest in this matter leading to undesirable results. A Range Officer charged a certain villager with possession in his house of a cart load of firewood the origin of which could not be satisfactorily accounted for by the owner. The Ranger argued that the firewood must have been brought from the adjacent reserve in which case it is an offence or from the still nearer unreserve in which case, again, firewood for sale or for other than domestic use (i. e. in head loads only) should not be collected. The case was ushered in court and the accused through his vakil pleaded that he purchased all the firewood from the coolies bringing headloads every evening. The accused was acquitted. The point in this case recorded by the Range Officer himself in his reports to the District Forest Officer but which he failed to make use of in the court was that the firewood consisted of Chloroxylon Swietenia—one of the Reserved trees in the District Classified list of trees issued under Section 26 of the

Madras Forest Act the removal of which except nnder seigniorage permit entails punishment of imprisonment for a term of up to one month or fine which may extend to two hundred rupees or both. The Magistrate also overloooked this important point in this matter, but the Ranger Officer's neglect of this important fact was inexcusable.

The second instance I am quoting betrays even a worse state of affairs in Range Administration. The notice served on the accused in forest offences gives them the option of paying the compounding fees either to the Range officer or in a treasury. In the latter case the treasury includes the amount in the "Taluk chitta" received in the Range office at the end of every month. Unaware of this remittance which is not intimated to him then and there, either by the treasury or by the accused, the Range Officer requests the Magistrate to take up the case against the accused who is unnecessarily dragged to court. The magistrate either refuses to take notice of the remittance in the face of the Range officer's requisition to take up the case and fines the accused on a trial conducted by him or he induces the Range Officer to withdraw the case. In both cases there are serious disadvantages, other than the trouble and expense to which the parties are put. In the first case, refund of the compounding fees paid into the treasury will have to be made—a serious addition to the Ranger's, Distritct Forests officer's and Conservator's office work and in the second case the offence will appear under "acquited cases" which as already said above is a reflection on the Ranger Officer. The remedy to this evil is suggested in the Forest Manual (Page 34) which is that "when compounding fees are paid to the treasury officers or magistrates by the parties, they should be credited to forest revenue and the fact intimated to the Range Officer immediately by means of a post card." No Treasury officer seems to attend to this rule and even after several unfortunate experiences the Range officers have not drawn the attention of the former to the omission on their part. On the day we attended the Stationary Sub-Magistrate's Court, on 25-3-1918, at Coimbatore, out of 6 cases posted for the day, 2 cases were of this kind. On a previous occasion when we attended the Bench Court there was one such case. This has been going on for years past and the rule is there in the Forest Manual which is the Ranger's daily companion in the office and which he brings to the court, perhaps, as an ornament to himself or for semi literate people to recognise him as the Range Officer. When this rule is pointed out to some Range officers, the Treasury officer was at once blamed in the matter. To such Range Officers I say "What have *you* done? When you met with one such instance was it not your duty to have referred to books and Standing Orders and pointed out the Treasury Officer's apparent neglect to your District Forest Officer so that a circular from the District Magistrate will set the matter right?"

Another most common omission in conducting forest cases in court is that sworn statement from Prosecution witnesses is not obtained as to the fact of reservation of the forest in which the offence took place. The date and page of the Fort St. George Gazette wherein the concerned Section 16 notification appeared will have to be sworn to. For this omission in the lower court, the High Court set aside the conviction passed by the former in a certain case and acquitted the accused. A Government order was at once issued laying down that the first thing to be proved in a trial of forest case is the fact of reservation having taken place. This rule is not to this day observed in several courts to my knowledge and appeals to the High Court being very rare the neglect is being perpetuated without the serious consequences following it.

4. With the subordinate magistracy recruited directly from the Bar and not from the lower subordinate clerical service as done at present, the Range Officers will find that their lack of knowledge of Law will no longer be passed unnoticed in courts. They won't get the help they now do from the magistrates in eliciting the important points in the prosecution case. The Evidence Act is a bit terse but has to be studied to face the opposing vakil and to win the day. A thorough knowledge of our departmental orders, the Evidence Act and the procedure in conducting cases in a court is sure to stand us in good stead at all times.

S. G. Venkatramanon,
Student, Senior Division.

The Practice Trial.

Protection of Forests in his charge is one of the primary duties of a Range Officer and forms one of the most important items of Range Administration. The Range Officer arranges for suitable protection, through his Forest Guards and beat watchers, aided by the Foresters and other subordinates under him.

The Forest Guards while patrolling their beats have to detect offences such as illicit fellings, grazing etc., and promptly report the occurrence to the Range Officer, after taking preliminary steps themselves such as finding out the accused, seizing property and tools, if any, and proper entrustment of the seizure with some responsible person. The Range Officer proceeds to make his own investigations and takes further steps.

To know all details of such important work and to properly conduct prosecutions in courts as Rangers, with due regard for all court formalities, a practice trial of a forest case was arranged in the Sadivayal camp. Both the Divisions took part in it, the Seniors being the prosecutors and the Juniors the accused who had to defend themselves, the Instructors being the Magistrates.

The case was proceeded on the basis of the following offences having been committed. Two persons were found carrying timber in the Reserve to load a cart standing on a fire line. The offence was detected by the Forest Guards of two neighbouring beats and a watcher, when they were returning after an inspection of a common fire line. While the men were being taken to the village, some of the villagers assaulted the Forest Subordinates and the cart was rescued. The next morning the cart was identified by a hammer mark, and this was seized and left in charge of the Village Magistrate.

The Forest Guards reported the occurrence to the Range Officer who, after investigating the case, sent up the usual forms of report to the District Forest Officer who sanctioned prosecution. Thereafter the case was sent for trial. Summonses were served on the accused and the witnesses in time before the trial. During the trial the prosecution witnesses blundered as to the locality itself where the offence was alleged to have taken place. There was only one hammer mark on the cart made by one of the guards and of which neither the watcher nor the other guard had any idea and it was passing strange why the guard should mark it only once and that unnoticed by others.

.However the charge sheet was framed. The defence was mainly based on the evidence of the Tahsildar of the Taluk who stated that the accused were with him on that particular date and hour when he was inspecting one of their fields. Although he betrayed some ignorance of Board's Standing Orders and of the exact duties of Revenue Inspectors, his evidence was considered to have weight. The defence brought forward another fact that there had been a quarrel between the accused and the guards about 'mamools' which the latter demanded and to which the Karnam of the village and another old man, who is next door neighbour to the accused, bore witness.

Even setting aside the defence, the prosecution evidence clearly showed that there were mistakes of fact and the benefit of doubt was given to the accused and they were acquitted.

M. Umapati,
Assistant Editor.

Athletics at the Madras Forest College, January to March 1918.

The months of January and February were spent in camp and March in head-quarters. Our playing field was ready on 1st March and we can have our games and Annual Sports on our own grounds in future. The Senior Division had no practice in any game at Walayar in January as a suitable ground could not be found near the camp. With heavy rains and a longer time spent at Kodamadi than last year, the Junior Division had no regular practice at foot-ball in Mundanthorai, where the excellent playground in the camp site has been further improved this year with the District Forest Officer's permission for which the students feel very grateful.

Marathon race. The annual Marathon race was run by the students of both divisions on the morning of 16th

February 1918. A detailed account of this appears elsewhere. On the whole, the results were well balanced between both divisions the 1st and 3rd prize winners being from the Senior Division and the 2nd, 4th and 5th from the Junior Division. The interdivision competition in this race was started for the first time this year and in this connection the students feel very grateful to Rissaldar Major Bahadur Amir Mahomed Khan (late XX Deccan Horse) for his generous present to the Athletic club of a Challenge Cup to be called the "Marathon Challenge Cup." The order of finishing of the first ten in each division was taken and the numerals indicating this order when added together gave 103 and 107 points respectively for the Juniors and Seniors, the former winning the cup by 4 points in their favour. On the evening of the 20th February, our Principal announced to us the institution of this cup so kindly presented by a friend of the College. He expressed his sympathy with the Rissaldar Major Bahadur in his present illness on return from active war service and wished for his speedy recovery. The students, to indicate their appreciation of the above, gave three vociferous cheers for the donar of the " Marathon Challenge Cup" Mr. Bennett Vice-President Athletic Club, presented the cup to the Junior student C. B. Chengappa.

The Six-a-side Foot-ball Tournament. This annual event was held from 20th to 26th February 1918 at camp Sadivayal. When he had played only 5 teams out of 6, Seshagiri Rao had won more points than the other captains and won the tournament. The successful team was unique in not allowing a single goal to be scored against it in all the five days it played. On the evening of the 27th idem, our Vice-President explained to us the defects in our play and the object of this annual tournament as being the fit opportunity for the Vice-President and the

Captain to select the best match players of the College Eleven. Mr. C. B. Dawson, the Senior Imperial Instructor then gave away the prizes to the successful team which were kindly awarded by our Vice-President.

This term is wholly devoted to foot-ball, but for occasional indulgence in cricket. The following matches were played.

Foot-ball. We met the Agricultural College on their grounds on 5th March 1918. A keen game was played which ended in our narrow defeat by nil to 1 goal. The return match was played on the 12th March on our grounds and the game ended in a draw neither side scoring.

We tackled the Stane's European High School on their ground on 19th March. This time better luck attended us and we won to the tune of 4 goals to 1, for 2 of which our Provincial Instructor Mr. Hart was responsible by kicking 2 good corner balls which were headed into the opposite goal by Students Venugopal Naidu and Seshagiri Rao. The return match with the Stanes School was played on 26-3-18. A well contested game was played and the result was draw both sides scoring 2 goals. Our 2 points were scored by Student Venugopal Naidu.

Cricket. On 24th March a Cricket match was played at the Agricultural College the Staffs of the 2 Colleges opposing the students of the Colleges. Sudden rains interrupted the game which had to be left unfinished. Details of scores and bowling analysis etc., will be given in the next issue of the Journal.

Colours. The following students were awarded their colours for foot-ball. (1) Seshagiri Rao, (2) C. L. Narayana Rao, (3) P. K. Parameswaram Pillay, and (4) A. Bhaviah.

Student Seshagiri Rao was appointed Vice-Captain for foot-ball.

S. G. Venkatramanon,
Assistant Secretary,
Athletic Club.

The Marathon Race.

The Marathon Race over a distance of 6 mile 5 fur. 100 ft. is one of the chief events during the combined camp at Sadivayal in February.

The distance is rendered difficult owing to steep ascents and descents which really make the course much more tedious than the measured length. The race starts at the College camp. The next obligatory point is on the hill side leading to Muthikulam ridge—a stiff ascent. Thence the third point is reached by a compartment line. From this point to the winning post at the camp the competitors can choose their own course. Two streams crossed have deep steep banks. Passing these obstacles takes the breath out of the men of heavier build. The difference in height between the starting point and the highest point along the course is about 650ft. Competitors must touch the obligatory points, and at each point one of the members of the College Staff checks them.

The race of this year came off on the 16th February. Students, particularly the enduriug set, evinced great zeal and keenness in the contest and were enthusiastically speculating on the possible winner.

We were given the start at 7 A. M. There was a very keen competition between Parameshwaram Pillay and C. B. Chengappa. They were very close together as far as the foot of the hill, when the latter had to lag behind a little owing to a cramp in his leg. On reaching the first obligatory point, the order of the 1st few runners was Parameshwaram Pillai, C. B. Chengappa Narasinga Rao, Kondathu Goundan, Narayana Rao and B. S. Chengappa. In the beginning there were a large number of Senior students among the first twenty and it was thought that the Divisional prize would go to them. But the Juniors pulled up and at last they won it. As for the heavier set of students, although they kept up a tolerably good speed as far as the foot of the hill, very much to their credit, they were afterwards beaten down by others of lighter bodies in going up the hill.

Snap-shots were taken as the winners were nearing the winning point. The Principal had been very kind to give drinks which everyone fully appreciated and felt thankful for after a hard run. The arrival of the last man was watched for with as much excitement as the first runner.

The Principal delivered a short speech after the race explaining how the Marathon Race brings out the latent physical capacities in a man and tries his powers of control. Although the 1st man was 2′ 45″ behind that of last year's race the Principal congratulated the runners on the good finish. He expressed his regret that the Instructors who were stationed at the intermediate points were not able to witness at least some of the winners reaching the winning point. He wanted the winners to help him if possible, to find out another course enabling the Instructors to reach the winnnig post as soon as possible. The medal and cups were then presented by Mr. Hart, the Honorary Secretary of the Athletic Club. The morning was brought to a close with loud cheers for the staff who had provided a gold medal and four silver cups to the first five successful competitors.

The times of the first five winners are :—

			Min.	Secds.
1.	P. K. Parameswaram Pillai	....	54	45.
2.	C. B. Chengappa	....	57	27.
3.	M. Narasinga Rao	....	60	30.
4.	C. L. Narayana Rao	....	61	24.
5.	B. S. Chengappa	....	62	0.

The time of the last man was 1 hr. 41½ min. 2 students were unable to finish the course owing to a break-down.

The times of the 1st man for the last 3 years are as follows :—

1918	P. K. Parameswaram Pillai	....	54′	45″.
1917	C. S. Nanjappa	....	52′	0″.
1916	C. S. Nanjappa	....	56′	15″.

The Senior students gave a treat to the winners the next evening and all of them enjoyed themselves thoroughly. A pleasant interlude of this nature breaks the routine work of camps and helps in a large degree to draw the students together.

A day or two after the Marathon, Vice-President, the Athletic Club presented the Divisional Cup offerred by Amir Mohammed Khan Resaldar Major Bahadur of 20th Deccan Horse, to C. B. Chengappa who represented the winners. The Principal after warmly eulogising the donor in fitting terms briefly alluded to the object of instituting such cups by men like the Resaldar Major, which is to bring about better co-operation among the students. It may not be out of place here to give a brief history of the donor of the prize. His age is now about 51 years. He went to England in 1892 and was member of Guard of Honour to His Majesty King George V on the occasion of His Majesty's marriage. He rendered valuable services during the last Burmese War and was awarded the War medal. During 1914, soon after the out-break of the present War he went to France and was in the Front till 21st December 1915, when he was severely wounded in his hip. He was then sent to Brighton Hospital where he remained for 7 months. His Majesty the King Emperor paid him a visit in the hospital and recognised him as having been in His Majestey's company in 1892. He then returned to India and was awarded Order of British India II class.

M. Umapati,
Assistant Editor.

Key to the Trees, Shrubs and Climbers observed about the Madras Forest College camp at Mundanthorai, Tinnevelli District.

The following list is the result of a single short visit to Mundanthorai and though Mr. H. A. Latham, Conservator of Forests, somewhat amplified the writer's notes, it must be held that the list is still very far from being complete.

The visit was paid at the end of January and so the seasonal notes regarding flowers and fruit refer to that time alone i. e., from 20th to 31st January.

The Tamil names were obtained, with a very few exceptions, from the working plans of the locality and have also been examined of Mr. Latham; they are entered in italics.

Unless otherwise stated, the dimensions given are of length.

The figures in square brackets refer back to the serial number of the plant when it occurs more than once in the list. The numbers in curved brackets refer to the serial number of the converse specification to that against which it appears.

The following abbreviations have been used:

ab. =above.
ac. =acute.
acm. =acuminate.
alt. =alternate.
Ap. =apex.
ba. =base.
bel. =below.
cart. =cartilaginous.
cau. =caudate.
cor. =coriaceous.
cord. =cordate.
cre. =crenate.
d. =diameter.
dis. =distichous.
dist. =distinct-ly.
El. =elliptic.
Ent. =entire.
Fl. =flower-s.
fol. =foliate.
Fr. =fruit-s
Gl. =gland-s
gla. =glabrous.
gld. =gland-dotted.
glr. =glandular.
ha. =hair-s-y.
L. =leaf, leaves.
lan. =lanecolate.
lat. =lateral.
Lo. =lobe-s-d.
Lt. =leaflet-s.
Mar. =Margin.
mem. =membranous.
Ner. =nerve-s-d.
num. =numerous.
ob. =obtuse.
obg. =oblong.
obl. =oblique.
obv. =obovate.
opp. =opposite.
ov. =ovate.
pel. =pellucid.
Pet. =petiole-d.
Petl. =petiolule-d.
Pin. =pinna-e.
pint. =pinnate.
pr. =pair-s.
prom. =prominent.
pub. =pubescent.
publ. =puberulous.
pun. =punctate.
Rch. =rhachis.
rou. =round-ed.
Sc. =scale-y.
sca. =scabrous.
ser. =serrate.
ses. =sessile.
sim. =simple.
Sp. =spine-s.
St. =stipule-s.
stel. =stellate.
str. =stipular.
Ten. =tendril.

This completes the series of Keys for the camps of the Madras Forest College.

I would be very much obliged if any one using these keys will inform me of any errors or short comings and any difficulties he has met with in their usage to enable me to improve future ones.

A. **Trees** (97).

I. L. sim. or 1-fol. (62).

1. L. alt. (50).

(i) Juice milkly (11).

§ Thorny.

1. Euphorbia antiquorum, *Linn.* (Euphorbiaceæ)
Thirukalli.

§§ not thorny.

(a) L. sca. or hispid.

(b) L. under 4″, 1-Ner at ba.

2. Streblus asper, *Lour.* (Urticaceæ).

(bb) L. over 4″, 3-5-Ner. at ba.

3. Ficus hispida, *Linn. f.* (Urticaceæ).

(aa) L. not sca. or hispid.

(b) L. 3-or more Ner. at ba.

(c) Reticulate Ner. pel.; Ap. of L. shortly caud.

4. Ficus Arnottiana, *Miq.* (Urticaceæ).

(cc) Reticulate Ner. not pel.; Ap. of L. not caud.

(d) L. pub. or tom. bel.

(e) Tom. fine; aerial roots large, abundant.

5. Ficus bengalensis, *Linn.* (Urticaceæ) Fr.

(ee) Tom. dense; aerial roots small, few.

(f) Tom. rusty-grey; Ner. of 4 about 5 pr.

6. Ficus tomentosa, *Roxb.* (Urticaceæ).

(ff) Tom. not rusty; Ner. of L. 10-13 pr.

7. Ficus mysorensis, *Heyne*. (Urticaceæ).

(dd) L. gla.

(e) L. cor.; Pet under $\frac{3}{4}''$.

8. Ficus retusa, *Linn*. (Urticaceæ) Fr.

(ee) L. mem.; Pet. over 1″.

9. Ficus glomerata, *Roxb*. (Urticaceæ).

(bb) L. 1-Ner. at ba.

10. Mimusops hexandra, *Roxb*. (Sapotaceæ).

(ii) Juice watery (1).

§ Thorny (17).

(a) L. gld.

11. Atalantia monophylla, *Corr*. (Rutaceæ).

(aa) L. not gld.

(b) L. white or buff tom-bel.

(c) L. very obl.; Fr. $\frac{3}{4}''$ d., woody.

12. Zizyphus xylopyra, *Willd*. (Rhamnaceæ) *Kotta*.

(cc) L. not or slightly obl.; Fr. $\frac{1}{2}''$ d., fleshy.

13. Zizyphus Jujuba, *Lam*. (Rhamnaceæ) *Elandai*.

(bb) not white or buff tom.

(c) L. 1-Ner. at ba.

(d) Ner. prom., straight.

14. Bridelia retusa, *Spreng*. (Euphorbiaceæ).

(dd) Ner. not prom, or conspicuously straight.

15. Diospyros montana, *Roxb*. (Ebenaceæ).

(cc) L. 3-Ner. at ba.

16. Alangium Lamarckii, *Thw*. (Cornaceæ).

§§ Not thorny (11).

(a) L. Lo.

(b) L. 2-Lo.

(c) L. Lo. ½ way down.

17. Bauhinia racemosa, *Lam.* (Leguminosæ) green Fr.

(cc) L. Lo. ¼ way down.

18. Bauhinia malabarica, *DC.* (Leguminosæ) green Fr.

(bb) L. 3-or more Lo.

(c) L. gla. or nearly so.

19. Gyrocarpus americanus, *Jacq.* (Combretaceæ)

(cc) L. tom. bel.

(d) L. velvety bel. Lo. cau-acm.

20. Sterculia urens, *Roxb.* (Sterculiaceæ).

(dd) L. white tom. bel.; Lo. ac.

21. Cochlospermum gossypium, *DC.* (Bixaceæ).

(aa) L. not Lo.

(b) L. cre. or ser. (33).

(c) L. white or grey pub or tom. bel.

(d) L. sca. with white discs ab.

22. Cordia fulvosa *Wight.* (Boraginaceæ) Fr.

(dd) L. not sca.

(e) Ton. stel.

23. Givotia rottleriformis, *Griff.* (Euphorbiaceæ).

(ee) Tom. not stel.

Zizyphus xylopyra, *Willd.* (12).

(cc) L. not white or grey bel.

(d) L. 3-6-Ner. at ba.

(e) L. 6-Ner. at ba.

24. Grewia tiliæfolia, *Vahl.* (Tiliaccæ) *Unnu.*

(ee) L. 3-Ner. at ba.

(f) L. pel.-pun.

25. Croton klotszchianus, *Wight.* (Euphorbiaceæ) Fl. and Fr.

(ff) L. not pel.-pun.
(g) L. very cor.
26. Celtis Wightii, *Planch.* (Urticaceæ).

(gg) L. mem.
27. Grewia disperma, *Rottl.* (Tiliaceæ) green Fr.

(dd) L. 1-Ner. at ba.
(e) L. obv.; ses. or sub-ses.
28. Careya arborea, *Roxb.* (Myrtaceæ) *Pootatanni-maram.*

(ee) L. not obv.; Pet. dist.
(f) Bark very smooth, greenish-white.
29. Terminalia Arjuna, *Bedd.* (Combretaceæ) Fr.

(ff) Back not conspicuously smooth or white.
(g) L. pel.-pun.
30. Gelonium lanceolatum, *Willd.* (Euphorbiaceæ). Buds.

(gg) L. not pel.-pun.
(h) L. lan., narrow.
31. Vaccinium neilgherrensis, *Wight.* (Vacciniaceæ) Fl.

(hh) L. El. or ov., not narrow.
32. Elædendron glaucum, *Pers.* (Celastraceæ).

(bb) L. ent. (22)
(c) L. sca. with white discs ab.
Cordia fulvosa, *Wight.* (22).

(cc) L. not sca.
(d) L. with scarlet Sc. bel.
33. Mallotus philippinensis, *Muell.-Arg.* (Euphorbiaceæ) Fl. & Fr. *Kapilapodi.*

(dd) L. without scarlet Sc.
(e) L. 3-or more Ner. at ba.
(f) L. 5-7-Ner. at ba.
34. Thespesia populnea, *Solaud.* (Malvaceæ) Fl. Planted as road avenue.

(ff) L. 3-Ner. at ba.

(g) L. pel. pun.

Croton klotszchianus, *Wight*. (25).

(gg) L. not pel.-pun.

(h) L. very cor.

Celtis Wightii, *Planch*. (26).

(hh) L. mem.

(j) L. nearly as broad as long.

Gyrocarpus americanus, *Jacq*. (19).

(jj) L. 2 or 3 times as long as broad.

Alangium Lamarckii, *Thw*. (16).

(ee) L. 1-Ner. at ba.

(f) L. pel.-pun.

(g) L. with St.; branches with str. lines at nodes.

Gelonium lanceolatum, *Willd*. (30).

(gg) L. Ex St.; branches without str. lines.

35. Polyalthia Korinti, *B&H. f.* (Anonaceæ) Fr. *Nadunari*.

(ff) L. not pel.-pun.

(g) L. ha. or pub. at least bel.

(h) L. with 1 or 2 Gl. at Ap. of Pet.

(j) Bark resembling crocodile hide.

36. Terminalia tomentosa, *Bedd*. (Combretaceæ).

(jj) Bark not resembling crocodile hide.

37. Terminalia Chebula, *Retz*. (Combretaceæ) *Kadukai*.

(hh) L. without Gl.

(j) L. thick, cor.

(k) L. with 6-10 pr. of Ner., ba. ac.

38. Diospyros melanoxylon, *Roxb*. (Ebenaceæ).

(kk) L. with 10-20 pr. of Ner., ba. rou.

39. Buchanania latifolia, *Roxb*. (Anacardiaceæ).

(jj) L. thin, mem.

Diospyros montana, *Roxb.* (15).

(gg) L. gla.

(h) L. under 1″, close set.

40. Phyllanthus Emblica, *Linn.* (Euphorbiaceæ) *Nelli.*

(hh) L. over 1″, not close set.

(j) L. dis.

41. Holoptelia integrifolia, *Planch.* (Urticaceæ).

(jj) L. not dis.

(k) Bark very smooth, light coloured.

(l) Bark greenish-white; Ner. of L. pel.

Terminalia Arjuna, *Bedd.* (29).

(ll) Bark white or yellowish; Ner. of L. not pel.

42. Anogeissus latifolia, *Wall.* (Combretaceæ) *Vekkali.*

(kk) Bark not conspicuously smooth, not light coloured.

(l) Mar. of L. pel.

43. Terminalia belerica, *Roxb.* (Combretaceæ) *Tanikai.*

(ll) Mar of L. not pel.

(m) Bark resembling crocodile hide.

Terminalia tomentosa, *Bedd.* (36).

(mm) Bark not resembling crocodile hide.

(n) L. obv. or cuneate-obv.

(o) L. under 3″.

44. Erythroxylon monogynum, *Roxb.* (Liniaceæ) Fl. & Fr.

(oo) L. over 3″.

45. Anacardium occidentale, *Linn.* (Anacardiaceæ)
Planted at Papanasam.

(nn) L. not at all obv.

(o) Axils of Ner. of L. usually glr.

(p) L. under 4″.

46. Hopea parviflora, *Bedd.* (Dipterocarpaceæ) *Vellaikongu.*

(pp) L. over 5″.

47. Balanocarpus utilis, *Bedd.* (Dipterocarpaceæ) Planted at Mundanthorai.

(oo) Axils of Ner. of L. not glr.

(p) Ner. of L. prom., straight.

Bridelia retusa, *Spreng.* (14).

(pp) Ner. of L. not prom., not conspicuously straight.

(q) L. over 6″, smelling of turpentine.

48. Mangifera indica, *Linn.* (Anacardiaceæ) Fl.

(qq) L. under 6″, not smelling of turpentine.

(r) L. subses.

49. Blachia calycina, *Benth.* (Euphorbiaceæ) Fl.

(rr) L. dist. Pet.

Elæadendron glaucum, *Pers.* (32).

2. L. opp. (1).

(i) St. interpetiolar or connate (56).

§ St. connate.

(a) Buds resinous; L. ob.

50. Gardenia latifolia, *Ait.* (Rubiaceæ).

(aa) Buds not resinous; L. ac.

51. Morinda citrifolia, *Linn.* (Rubiaceæ) *Manjapavattai.*

§§ St. free.

(a) Ba. of L. narrowed to Pet.

52. Hymenodyctyon excelsum, *Wall.* (Rubiaceæ) Fl.

(aa) Ba. of L. rou. or cord.

(b) L. abruptly acm.

53. Adina cordifolia, *H. f.* (Rubiaceæ) *Manjakadambai.*

(bb) L. usually ob., not acm.

(c) Ner. of L. 6-8 pr.

54. Stephegyne parvifolia *Korth.* (Rubiaceæ).

(cc) Ner. of L. 8-10 pr.

55. Stephegyne tubulosa, *H. f.* (Rubiaceæ) green Fr.

(ii) St., if present, not interpetiolar or connate (50).

§ L. ha. or hispid.

56. Tectona grandis, *Linn.* (Verbenaceæ) Fl. *Tekku.*

(a) Juice watery.

Ficus hispida, *Linn. f.* (3).

(aa) Juice Milky.

§§ L. gla.

(a) Juice milky.

57. Wrightiatinctoria, *Br.* (Apocynaceæ) green Fr.

(aa) Juice watery.

(b) L. gld.

58. Eugenia Jambolana, *Linn.* (Myrtaceæ) *Naval.*

(bb) L. not gld.

(c) L. 3-Ner. at ba.

59. Strychnos potatorum, *Linn. f.* (Loganiaceæ) *Tetankottai.*

(cc) L. 1-Ner. at ba.

(d) L. subses.

Blachia calycina, *Benth.* (49).

(dd) L. dist. Pet.

(e) Twigs quadrangular.

60. Pleurostylia Wightii, *W & A.* (Celastraceæ) Fr.

(ee) Twigs rou.

(f) L. decussate.

61. Santalum album, *Linn.* (Santalaceæ) Fl. Introduced at Mundantharai.

(ff) L. not decussate.

Elœodendron glaucum, *Pers.* (32).

II. L. com (1).

1. L. opp. (66)

(i) L. 3-5 fol.

§ Lt. dist. Pett.; Pet. not at all winged.

62. Vitex leucoxylon, *Linn f.* (Verbenaceæ)

§§ Lt. subses.; Pet. winged.

63. Vitex altissima, *Linn. f. var*: alata. (Verbenaceæ).

(ii) L. pint.

§ Lt. acm. or ob.; Ner. 4-6 pr.

64. Dolichandrone crispa, *Seem.* (Bignoniaceæ) Fl.

§§ Lt. can.-acm.; Ner. 8-10 pr.

65. Stereospermum chelonoides *DC.* (Bignoniaceæ) *Pompadirai.*

2. L. alt. (62).

(i) Thorny (75).

§ L. over 4 feet.

66. Cycas circinalis, *Linn.* (Cycadaceæ) green Fr.

§§ L. under 1 foot.

(a) L. gld.

(b) Lt. 3.

67. Limonia alata, *W & A.* (Rutaceæ).

(bb) Lt. 5-9.

68. Limonia acidissima *Linn.* (Rutaceæ)

(aa) L. not gld.

(b) L. digitate.

69. Bombax malabaricum, *DC.* (Malvaceæ).

(bb) L. not digitate.

(c) L. 3-fol.

(d) L. with St. & stipels.

70. Erythrina indica, *Linn.* (Leguminosæ) Fl. Planted at Papanasam.

(dd) L. without St. & stipels.

71. Protium caudatum *W & A.* (Burseraceæ).

(cc) L. 2-pint.

(d) Thorns straight.

(e) Bark dark-brown, deeply cracked.

72. Acacia arabica *Willd.* (Leguminosæ) *Karuvelam.*

(ee) Bark yellowish-white, smooth.

73. Acacia leucophlœa, *Willd.* (Leguminosæ) *Velvelam.*

(dd) Thorns hooked.

74. Acacia Sundra, *Prain.* (Leguminosæ) *Karungali.*

(ii) Not thorny (66).

§ L. 2-fol.

75. Hardwickia binata, *Roxb.* (Leguminosæ) *Acha.* Introduced.

§§ L. 3-or more fol.

(a) L. 3-fol.

(b) Lt. ac. or acm.

76. Cratæva religiosa, *Forst.* (Capparidaceæ).

(bb) Lt. ob.

77. Walsura piscidia, *Roxb.* (Meliaceæ).

(aa) L. more than 3-fol.

(b) L. digitate.

(c) Lt. ac., shining, under 4½″.

78. Heptapleurum venulosum, *Seem.* (Araliaceæ) Sometimes epiphytic.

(cc) Lt. cuspidate, not shining, over $4\frac{1}{2}''$.

Bombax malabaricum, *DC.* (69).

(bb) L. not digitate.

(c) L. 1-pint.

(d) L. paripint.

(e) Mar. of Lt. ent.

(f) Lt. 20 or more.

(g) L. gld.

79. Chloroxylon Swietenia, *DC.* (Meliaceæ).

(gg) Lt. not gld.

80. Tamarindus indica, *Linn.* (Leguminosæ) *Pulĭ.*

(ff) Lt. fewer than 20.

(g) Lt. pub. bel.

81. Sapindus laurifolius, *Vahl.* (Sapindaceæ) Fl.

(gg) Lt. gla.

(h) Lt. 4-8 pr., equal, ac.

82. Cassia Fistula, *Linn.* (Leguminosæ) green Fr. *Konnaĭ.*

(hh) Lt. 3 pr., basal ones smaller, ob.

83. Schleichera trijuga, *Willd.* (Sapindaceæ) *Poovan.*

(ee) Mar. of L. ser.

84. Azadirachta indica, *A. Juss.* (Meliaceæ) *Veppam.*

(dd) L. imparipint.

(e) Main Ner. num., close, prom.

85. Pterocarpus Marsupium, *Roxb.* (Leguminosæ) *Vengaĭ.*

(ee) Main Ner. few, not close or prom.

(f) L. gld.

86. Clausena indica, *Oliv.* (Rutaceæ).

(ff) L. not gld.

(g) Lat. Lt. opp.

(h) Lt. ob.

87. Aglaia Roxburghiana, *Miq.* (Meliaceæ) Fl. Rarely 3-fol.

(hh) Lt. ac.

(j) Lt. 7-11, cau.; Petl. under ¼″.

88. Odina Wodier, *Roxb.* (Anacardiaceæ).

(jj) Lt. 5-9 (usually 5), not cau.; Petl. over ¼″.

89. Pongamia glabra, *Linn.* (Leguminosæ) *Poongamaram.*

(gg) Lat. Lt. alt.

(h) Lt. not more than 1″.

90. Dalbergia paniculata, *Roxb.* (Leguminosæ) *Arivagai.*

(hh) Lt. over 1″.

91. Dalbergia latifolia, *Roxb.* (Leguminosæ) *Thothakattai,*

(cc) L. 2-or 3-pint.

(d) Rch. & rhachides of L. articulated.

92. Moringa pterygosperma, *Gærtn.* (Moringaceæ) Fl. Planted at Papanasam.

(dd) Rch. & rhachides of L. not articulated.

(e) L. without Gl.

93. Melia dubia, *Cov.* (Meliaceæ).

(ee) L. with Gl. on Rch.

(f) Pin. 6 or more pr.

94. Albizzia amara, *Boiv.* (Leguminosæ) *Woonga, Usil.*

(ff) Pin. 4. pr. or less.

(g) Lt. 5-9 pr., over 1″.

95. Albizzia Lebbek, *Benth.* (Leguminosæ) Fr.; leafless. *Vagai.*

(gg) Lt. 10-20 pr., under 1″.

96. Albizzia ordoratissima, *Benth.* (Leguminosæ) Fr. *Karuvagai.*

B. **Bamboos** (1).

97. Bambusa arundinacea, *Willd.* (Graminaceæ) Introduced.

C. **Shurbs & under-shurbs** (145).

I. L. sim. (129).

1. L. alt. (115).

(i) Thorny.

§ L. over 3 feet.

98. Pandanus fascicularis, *Lam.* (Pandanaceæ).

§§ L. under 1 foot.

(a) L. over 2″, bearing Sp.

99. Solanum indicum, *Linn.* (Solanceæ) Fl.

(aa) L. under 2″, not bearing Sp.

(b) Thorns straight, bearing L.

100. Flacourtia sepiaria, *Rich.* (Bixaceæ) Fr.

(bb) Thorns hooked, not bearing L.

101. Capparis spinosa, *Linn.* (Capparidaceæ).

(ii) Not thorny.

§ L. ent. (109).

(a) L. stel. woolly.

102. Solanum verbascifolium, *Linn.* (Solanaceæ) Fl.

(aa) L. not stel. woolly.

(b) L. sca.

103. Ehretia buxifolia, *Roxb.* (Boraginaceæ).

(bb) L. not sca.

(c) L. with peltate Sc. bel.

104. Homonoia riparia, *Lour.* (Euphorbiaceæ).

(cc) L. without Sc.

(d) L. gla.

(e) L. ac. or apiculate.

105. Dodonœa viscosa, *Linn.* (Sapindaceæ) Fr. *Virali.*

(ee) L. ob.

(f) L. hard & shining.

106. Maba buxifolia, *Pers.* (Ebenaceæ) *Erumbili.*

(ff) L. mem., not shining.

107. Cadaba indica, *Lam.* (Capparidaceæ).

(dd) L. publ. bel.

108. Actephila excelsa, *Muell.-Arg.* (Euphorbiaceæ) Fl. & Fr.

§§ L. not Ent. (102).

(a) L. Lo.

(b) L. 2-Lo.

109. Bauhinia tomentosa, *Linn.* (Leguminosæ) Fr.

(bb) L. more than 2-Lo.

(c) L. under 1½″.

Ehretia buxifolia, *Roxb.* (103).

(cc) L. over 2″.

(d) L. gla.

110. Jatropha Curcas, *Linn.* (Euphorbiaceæ).

(dd) L. sca. or pub,

111. Helicteres Isora, *Linn.* (Sterculiaceæ) Fl. *Valamburi.*

(aa) L. not Lo.

(b) L. 3-Ner. at ba.

(c) L. sca.; Fl. white.

112. Grewia orientalis, *Linn.* (Tiliaceæ) Fl.

(cc) L. not sca., Fl. yellow.

113. Grewia flavescens, *Juss.* (Tiliaceæ) Fl.

(bb) L. 14-or 7-Ner at ba.

(c) L. 4-Ner. at ba.; densely villous bel.

114. Grewia hirsuta, *Vahl.* (Tiliaceæ) Fr.

(cc) L. 7-Ner. at ba.; thinly stel.-ha. bel.

Helicteres Isora, *Linn.* (111).

2. L. opp. (98).

(i) Thorny (121).

§ Juice milky.

115. Carissa Carandas, *Linn.* (Apocynaceæ).

§§ Juice watery.

(a) St. interpetiolar or connate.

(b) L. 1″ or less.

116. Canthium parviflorum, *Lam.* (Rubiaceæ) Fr.

(bb) L. over 1″.

(c) L. pub. bel.; Fr. ¾″ d. or more.

117. Randia dumetorum, *Linn.* (Rubiaceæ) Fr. *Kadukarai.*

(cc) L. gla.; Fr. under ½″ d.

118. Randia malabarica, *Lam.* (Rubiaceæ) Fr.

(aa) St. neither interpetiolar nor connate.

(b) L. pub., ser.

119. Lantana Camara, *Linn.* (Verbenaceæ) Fl.

(bb) L. gla., not ser.

120. Gmelina asiatica, *Linn.* (Verbenaceæ).

(ii) Not thorny (115).

§ St. interpetiolar or connate.

(a) L. shining.

(b) L. el. or lan., ac. or acm.

121. Webera carymbosa, *Willd.* (Rubiaceæ).

(bb) L. obv., ob.

Randia malabarica, *Lam.* (118).

(aa) not shining.

122. Pavetta indica, *Linn.* (Rubiaceæ) *Pavettai.*

§§ St. neither interpetiolar nor connate.

(a) Juice milky.

123. Holarrhœna antidysenterica, *Wall.* (Apocynaceæ) *Danthapalai.*

(aa) Juice watery.

(b) L. gla.

(c) L. ser.

124. Permna procumbens, *Moon.* (Verbenaceæ) Fr.

(cc) L. not ser.

(d) Ap. of L. ac.

125. Memecylon Edule, *Roxb.* (Melastomaceæ) Fr.

(dd) Ap. of L. rou.

Gmelina asiatica, *Linn.* (120).

(bb) L. ha. or silky, at least bel.

(c) L. rugose.

126. Lantana indica, *Roxb. var:* alba. (Verbenaceæ) Fl.

(cc) L. not rugose.

(d) Ba. of L. rou. or cord.

127. Clerodendron infortunatum, *Linn.* (Verbenaceæ).

(dd) Ba. of L. tapering.

128. Stenosiphonium Russellianum, *Nees. var*: subsericea *T. And.* (Acanthacæ) Fl. *Uringi.* Often thought to be a species of Strobilanthes.

II. L. Com. (98).

1. L. 3-5-fol.

(i) L. white-tom. bel.

129. Vitex Negundo, *Linn.* (Verbenaceæ).

(ii) L. not white-tom.

§ L. ha.

130. Allophilus Cobbe, *Bl.* (Sapindaceæ).

§§ L. gla.

(a) Thorny.

131. Balsamodendron Berryi, *Arn.* (Burseraceæ).

(aa) Not thorny.

(b) Secondary Ner. dist.

132. Cadaba trifoliata, *W & A.* (Capparidaceæ) Fl.

(bb) Secondary Ner. very indist.

133. Nieburhia linearis, *DC.* (Capparidaceæ).

2. L. pint.

(i) L. 1-pint. (143).

§ Lt. gld.

(a) Lt. 3-7 (rarely 1 or 2).

134. Glycosmis pentaphylla, *Corr.* (Rutaceæ).

(aa) Lt. 10-20.

135. Murraya Kœnigii, *Spreng.* (Rutaceæ) Fr. *Kariveppam, The curry-leaf plant.*

§§ L. not gld.

(a) Thorny.

(b) L. under 6″.

136. Dalbergia mimosoides, *Franchet.* (Leguninaceæ) Fr.

(bb) L. over 3 feet.

(c) Lt. plicate, Sp.-tipped.

137. Phœnix humilis, *Royle.* (Palmaceæ) *Ichampannai.*

(cc) Lt. flat, not Sp.-tipped.

Cycas circinalis, *Linn.* (66).

(aa) Not thorny.

(b) St. large, ear.-shaped.

138. Cassia auriculata, *Linn.* (Leguminosæ) Fl. *Avaram.*

(bb) St. small, not ear shaped.

(c) Large shurbs.

(d) Lt. 17-23, bark corky.

139. Mundulea suberosa, *Benth.* (Leguminosæ) Fr.

(dd) Lt. 7-12, bark not corky.

140. Cipadessa fruticosa, *Bl.* (Meliaceæ).

(cc) Undershrubs.

(d) Lt. 9-13, obv.-obg., nearly gla.

141. Indigofera tinctoria, *Linn.* (Leguminosæ) Fr. Run wild from cultivation.

(dd) Lt. 13-19, narrow obg., silkly bel.

142. Tephrosia villosa, *Pers.* (Leguminosæ) Fl.

(ii) L. 2-pint. (134).

§ Large shurb, Thorns large, L. not sensitive.

143. Dichrostachys cinerea, *W & A.* (Leguminosæ). Fl. *Vadatarai*

§§ Small plant, prickly L. very sensitive.

144. Mimosa pudica, *Linn.* (Leguminosæ) Fl. *The sensitive plant.*

D. **Climbers** (98) or straggling shurbs.

I. L. sim. (78).

1. Ap. of L. ending in a Ten.

145. Gloriosa superba, *Linn.* (Liliaceæ) Fl.

2. Ap. of L. not ending in a Ten.

(i) L. alt. (60).

§ Ten. present.

(a) Stems acutely 4-angled.

146. Vitis quadrangularis, *Wall.* (Vitaceæ) Fl.

(aa) Stems rou.

(b) L. without Gl.

147. Momordica dioica, *Roxb.* (Cacurbitaceæ) Fl.

(bb) L. with 1 or more Gl. bel.

(c) Plant with viscid ha.

148. Passiflora fœtida, *Linn.* (Passifloraceæ).

(cc) Plant gla.

149. Modeca palmata, *Lam.* (Passifloraceæ).

§§ Ten. absent.

(a) Thorny.

(b) L. minute with axillary cladodes.

150. Asparagus racemosus, *Willd.* (Liliaceæ).

(bb) L. patent.

(c) L. silky bel., ba. obl.

151. Zizyphus œnoplia, *Thuill.* (Rhamnaceæ) Fr.

(cc) L. gla., ba. not obl.

152. Pisonia aculeata, *Linn.* (Nyctaginaceæ) Fl. *Mosannai.*

(aa) Not thorny.

(b) Ba. of L. 3-5-Ner.

(c) Mar. of L. cart.

153. Dioscorea oppositifolia, *Linn.* (Dioscoriaceæ) Buds.

(cc) Mar. of L. not cart.

(d) L. cor., stem smooth.

154. Pachygone ovata, *Miers.* (Menispermaceæ) Fl.

(dd) L. mem., stem grooved.

155. Aristolochia indica, *Linn.* (Aristolochiaceæ) Fl.

(bb) Ba. of L. 1-Ner.

(c) L. fleshy.

156. Basella rubra, *Linn.* (Chenopodiaceæ) Fl.

(cc) L. not fleshy.

(d) Many opp. spirally hooked branchlets.

157. Hugonia Mystax, *Linn.* (Linaceæ) Fr.

(dd) No spirally hooked branchlets.

(e) L. light green, not shining.

158. Blepharispermum petiolare, *DC.* (Compositeæ) Fl. & Fr.

(ee) L. dark green, shining ab.

159. Ventilago madraspatana, *Grah.* (Rhamnaceæ) Fl.

(ii) L. opp. (146).

§ Juice watery (164).

(a) L. gla.

(b) Mar. of L. cart.

Dioscorea oppositifolia, *Linn.* (153).

(bb) Mar. of L. not cart.

(c) Ten. present.

160. Strychnos colubrina, *Linn. Var*: Zeylanica. (Loganiaceæ) Buds.

(cc) Ten. absent.

(d) Young shoots jointed & swollen at nodes.

161 Gnetum scandens, *Roxb.* (Gnetaceæ).

(dd) Shoots neither jointed nor swollen at nodes.

(e) L. 4-7″, Ner. prom. bel.

162. Hiptage Madablota, *Gærtn.* (Malpighiaceæ).

(ee) L. 2-4″, Ner. not prom. bel.

163. Combretum ovalifolium, *Roxb.* (Combretaceæ).

§§ Juice milky (160).

(a) Young parts fulvous tom.

164. Ichnocarpus furtescens, *Ait.* (Apocynaceæ) Fl.

(aa) Young parts not fulvous tom.

(b) Small Gl. just ab. Pet.

165. Marsdenia volubilis, *T. Cooke.* (Asclepaidaceæ).

(bb) No Gl. or L.

(c) L. gla. bel.

(d) L. 1″ or more, broad.

166. Cryptolepis grandiflora, *Wight.* (Asclepaidaceæ) Fl.

(dd) L. ½″ or less broad.

167. Secamone Emetica, *R. Br.* (Asclepaidaceæ).

(cc) L. pub. or hoary bel.

(d) L. deeply cord.

168. Dæmia extensa, *Br.* (Asclepaidaceæ). Fl.

(dd) L. not cord.

169. Hemidesmus indica, *R. Br.* (Asclepaidaceæ).

II. L. Com. (145).

1. Ten. present.

(i) L. 3-fol.

170. Vitis carnosa, *Wall.* (Vitaceæ) Fl. & Fr.

(ii) L. pedate.

§ Plant pub.

171. Vitis pedata, *Vahl.* (Vitaceæ).

§§ Plant gla.

172. Vitis lanceolaria, *Roxb.* (Vitaceæ).

2. Ten. absent.

(i) Thorny.

173. Toddalea aculeata, *Pers.* (Rutaceæ) Fr.

(ii) Not thorny.

§ L. 3-fol.

(a) Lt. shining, 2″ or less.

174. Jasminum calophyllum, *Wall.* (Oleaceæ) Fl.

(aa) Lt. not shining, over 3″.

175. Canavalia ensiformis, *DC.* (Leguminosæ) Fl.

§§ L. more than 3-fol.

(a) L. 5-7-fol.

176. Clitorea ternatea, *Linn.* (Leguminosæ) Fl.

(aa) L. pint.

(b) L. paripint.; Lt. 20-40.

177. Abrus precatorius, *Linn.* (Leguminosæ) Fl. & Fr.

(bb) L. imparipint.; Lt. 9-19.

178. Derris scandens, *Benth.* (Leguminosæ).

C. Fischer.

Occasional Notes.

Tu premes umbonem : coetera nos facimus.

We should like it to be generally understood that the Magazine is produced primarily by the Ranger class and for the Ranger class (inclusive of Deputy Rangers). We therefore particularly welcome contributions from that class. No one need hold back on the plee of unfamiliarity with idomatic journalese.

We will do our best to remedy any defects of composition : but we want *you* to supply the copy—lots of it and often *ut veniant omnes.*

The Students and Staff are now supplied twice a day, with milk and dairy produce from the Agricultural College and are no longer dependent on the interested efforts of outsiders and servants whose aim was to make as large a profit as possible at the expense of the health of those condemned to take the adulterated mixture that the vendors were pleased to term 'milk.'

The followtng roads and paths are now under construction.

Road round the Athlelic Ground.
Path from the College to the carpenter's shop.
Path from the College to the Athletic Ground.
" " " the Gymnasium to No. I Hostal.
" " " each Hostel to the Hostel Road.
The East end of the Lodge road is being straightened.

The Athletic ground has been practically completed. The first foot-ball match was played on it against the Agricultural College on 12-3-1918.

Two Badminton courts are being formed between the Hostels.

The College Challenge Cups will in future, on Prize Day, be placed on brackets in "Gamble."

The Tablets commemorating captains of games, winners of the Pentland Shield, winners of Marathon &c., are being put up in the rear Entrance Hall.

An Engineering Park has been formed opposite the Arboretum.

Arrangements are being made to form Students Gardens near the Hostels.

Mr. C. E. C. Fischer, late Principal, the Madras Forest College, read a paper at the Science Congress lately held at Lahore.

The appointment of Mr. T. R. D. Bell, as Chief Conservator, Bombay Presidency, has now been gazetted.

Mr. Hanumantha Rao has been appointed Estate and Sanitary Overseer of the College.

Miscellanea.

Derivation of Forest: Latin *Foresta-ubi-fera-stat* (where the wild beast stands), or *Ferrarum statio* (The standing place of wild beast).

Sind is said to possess only some 10 species of trees.

Rainfall over the whole of India averages 42″.

6% is utilised in irrigation, 35% runs to waste into the sea, 59% is absorbed by the soil or lost by evaporation.

7 tons of wood fuel distil 100 lbs oil (value Rs 3700)

Sandal : ~~10 tons of wood fuel or 4 tons coal required to distil 1 lb sandal oil (value Rs. 37—8—0)~~. from 1 ton Sandalwood (value Rs 1400/-) Correct figure since pointed out by Rai Sahib Mr. K. Venkataramana Iye E. D.

Madras Forest College is 1405′ above M. S. L.

A hundred years ago the *Landes* country in the South-West of France consisted of morasses and swamps on which the sand from the sea was rapidly encroaching. The tract was infested by a deadly fever, that left the sparse inhabitants anaemic and emaciated. The country could only be traversed on long stilts and was over-run by wolves and wild horses. To purchase land, a man stood on a hillock and called as far as his voice would carry in every direction, the area Cov by his voi was his for Rs. 15. Owing to the work of the Forest Department that land now brings in a net return of Rs. 7—8—0 per acre per annum. The Forest Department has restored a lost Province to France.

The highest class of sandal is now worth about Re. 1 per lb. or Rs. 50 per cubic foot.

In 1914, the value of matches imported into India amounted to about lakhs 74; the whole of this quantity could be manufactured in India.

The import of non-safety matches into Burma is prohibited.

Borassus flabelliformis—about 15 leaves are produced every year.

In France about Rs. 20,25,600 are annually spent on the restoration of denuded slopes. No financial return is expected from this expenditure.

For every 100 tons of coal raised, 1 ton of timber is required.

A first class battleship requiries 1000 tons teak for its construction.

Pinus palustris—Pitch pine from Florida—is said to be superior to a girder of wrought iron of its own weight; if employed as a beam it will bear, without bending, 7 times the load of an iron bar of the same length and weight. It has the same carbonisation or melting point as steel: i. e., if used in building the same insurance rates only are demanded.

Bombax malabaricum is a reserved tree in Travancore.

In 1871, John Scott established the fact that sandal is a parasite on various species.

The ultra violet rays causes heat and light strokes—also sunburn. They are beyond the V and X rays in the spectrum.

Glass is impermeable to them, but the camera plate is sensitive to them.

They induce Parthenogenesis: e. g., they cause the eggs of sea urchins to divide. True ants (Hymenoptera not Termites) detest ultra violet rays. A colourless solution of quinine sulphate or of certain other compounds is impermeable to these rays. If placed over violet, and hence ultra-violet rays, the ants are content. White light therefore must present to the ants a very different appearance to our view of it: hence a difference in the out-look of life.

In 1876—77 the net Forest Revenue of the Madras Presidency was Rs. 1342: in 1916—17 Rs. 19.95 lakhs.

Capital at 3½% compound interest doubles itself in 20 years.

Capital at 4% in just over 17 yesrs.

" 5% iu just over 15 years.

At the explosion of the mine at Messines in Flanders last Jnne, 50,000 lbs. of blasting substance were used and Rs. 1,200,000 worth of timber (in the form of props, planking &c.) was destroyed.

" In its forests lies the heart of a nation, and a people without forests is very close to extinction."

A. Theuriet.

Correct method of flying the Union Jack.

" If you look carefully at the flag you will see that the diagonal red cross has thick strips of white on one side of each arm and a thin border on the other, but they are arranged alternately. You must first decide which end of the flag is to be attached to the line or pole, and then place the flag so that the thick white strip is above (and the thin white strip is below) the two red diagonal strips that run from the centre of the flag to the points of attachment to the pole."

Quinine is said to be an excellent remedy for either wasps or scorpion stings. The part affected should be incised with a sterelised razor and powdered quinine should be rubbed gently into the wound. The application of a ligature is advisable.

Quinine may at the same time be taken internally to ward off the cold in the head and the choking sensatian in the throat.

List of contributions to the Gass Forest Museum, since October 1917.

No.	Contribution.	Contributor.
1.	One egg laid by a full sized hen on the Forest College estate.	W. C. Hart, Esq.
2.	Three samples of Indian paper. (1) Bambusa polymorpha, laid. (2) Saccarum spontaneum, laid. (3) Do. sample (2) woven.	F. L. C. Cowley-Brown, Esq., I. F S.
3.	Botanical specimens, of spiked sandal.	Muhamud Abdul Karim Sahib Bahadur, Esq. E. A. C., Talamalai.
4.	A piece of sandal showing a ring of heartwood, inside which, there is a layer of sapwood.	Do.
5.	Bark of Lagerstrœmia parviflora with a climber seeming to pierce it and emerge outside, as a result of occlusion.	Mr. Swami Kutty, M.R.H., Forest Ranger.
6.	A piece of Red sanders, sound to all appearence, but revealing a healed wound inside, when sawn.	M. R. Ry., S. Chinnadorai Pillai, B. A., M. R. Hon, R. O. Balapalli Range.
7.	Ants' nest	Students, Narasinga Rao and Abdul Gaffur of the Forest College.
8.	A tree frog	Student J. A. Stephen, M. F. C.
9.	Timber specimens Long panels 50 Short " 67 Blocks 92	A. W. Lushington Esq., C. I. E., (Returned after the Madars Exhibition).
10.	Six charcoal briquettes. ...	The Forest Ecomist.
11.	4 wooden cow-bells ...	M. R. Ry., P. Venkataramanan, Avl., B. A., E. A. C., Upper Godavari.
12.	A piece of the climber-Gnetum scandens.	A. W. Lushington Esq., I. F S
13.	Crocodile skin	C E. C. Fischer, Esq., I F. S.
14.	147 Mounted botanical specimens ...	Do.
15.	Sample of good charcoal ...	H. C. Bennett Esq., I. F. S.
16.	One bison head	A. M. C. Littlewood Esq.,

Gazette Notifications.

November 6. 1917.

The one month's privilege leave granted to M. R. Ry., C. M. Kunhiraman Nayar, M. R. Hon. Ranger, fourth grade, South Cuddapah district, from 25th October 1917, in this office Service Order No. 140, with effect dated 19th September 1917, is cancelled.

1. M. R. Ry., A. Siddan Pillai, M. R. H. Ranger, fifth grade, in charge of Porumamilla Range, North Cuddapah district, is granted privilege for two months with permission to affix Christmas holidays with effect from date of relief.

2. M. R. Ry., V. P. Narayana Menon, Ranger, fourth grade, in charge of Badvel range of the same district, to hold charge of Porumamilla range in addition to his own on relief of No. 1.

M. R. Ry., N. E. Kanakiah, M. R. L. Ranger, fourth grade, sub-protem, in charge of Bellary range, Bellary district, having been appointed as Assistant Recruiting Officer, Bellary district, the following arrangement is ordered as a temporary measure subject to the Board's approval :—

V. Jagannadham Pillai, Deputy Ranger, first grade, Anantapur district, appointed to act as Ranger, sixth grade, in this office Service Order No. 126, dated 15th August 1917, on relief of Kadiri range charge by M. R. Ky., R. Alagiriswami Nayudu, Ranger fifth grade, on return from privilege leave, is posted to the charge of Bellary range, Bellary district.

M. R. Ry., V. Narayana Ayyar, Ranger, second grade, Paralakimedi Maliahs, is granted privilege leave for one month and fifteen days with effect from date of relief.

(1) M. R. Ry., N. L. Narasimham, Ranger, fourth grade, on expiry of the privilege leave for three months granted to him, is posted to Kurnool East for the charge of Cumbum range.

(2) On relief by No. (1) M. R. Ry., R. P. Jeevappa Nayack, Ranger, second grade, is granted furlough for one year.

Mr. T. I. Chakko, Ranger, third grade is transferred from Tinnevelly for duty under Mr. T. N. Hearsey, Extra Assistant Conservator of Forests, on special duty. To join at Denkanikota forthwith.

M. R. Ry., S. M. Krishnaswami Ayyar, Ranger, fourth grade, is posted for the charge of Tinnevelly Range.

November 13, 1917.

Under rule 2, under article 339 of the Civil Service Regulations, Mr. A W. Lushington, temporary Assistant to the Forest Commissioner, is granted leave without allowances for three weeks from 13th October 1917.

November 20, 1917.

The following postings of Forest officers are ordered :—

Mr. D. L. Sathe, District Forest Officer, Chittoor on return from leave to be District Forest Officer, Nellore.

Mr. C. E. C. Ficher, District Forest officer, Nellore to be District Forest Officer, Chittoor from or after 13th January 1918.

Mr. F. R. Madan, District Forest Officer East Kurnool to be District Forest officer West Kurnool.

M. R. Ry., K. Gajaraja Mudaliyar Avargal, Extra Assistant Conservator of Forests, to be District Forest Officer, East Kurnool.

(This cancels notification 372, dated 31st August 1917, published at the page 1077 of part 1 of the Fort St. George Gazette, dated 4th September 1917, granting Mr. F. R. Madan, privilege leave for two months).

Consequent on the retirement of M. R. Ry. A. P. Singaravelu Mudaliyar, Ranger third grade permanent and second grade sub-pro-tem, the following promotions are made in the class of Rangers with effect from 25th August 1917, the date of retirement.

M. R. Ry., P. Velayudhan Nayar from third Grade permanent to second grade sub-pro-tem.

M. R. Ry., T. G. Sankara Nayar, M. R. H. from third grade sub-protem to third grade permanent.

M. R. Ry., P. Muduraimuthu Pillai, from fourth grade, permanent, to third grade sub-pro-tem.

M. R. Ry., A. P. Srinivasa Ayyangar M. R. H. from fifth grade permanent, to fourth grade sub-pro-tem.

Mr. D. E. Lewin M. R. H. Ranger sixth grade on special duty Kodur Range, South Cuddapah district is granted privilege leave on medical certificate for one month with effect from 9th November 1917.

November 27, 1917.

In the vacancy caused by the reversion of Mr. N. E. Shrigley to the Bombay service, M. R, Ry,, V. S. Subramania Ayyar, Forest Ranger, second grade, Northern Circle, is appointed special Forest Officer, Golconda Agency and Hill Madgole in the Vizagapatam district.

Muhammad Habibullah Saheb Bahadur, Extra Assistant Conservator working under the Working Plans Officer, Tinnevelly, to the Western circle to work under the District Forest Officer, Coimbatore South.

M. R. Ry., R. Guruswamy Ayyar, Ranger, first grade, from South Mangalore division to North Mangalore division to charge of Coondapoor range.

Mr. K. C. Joseph, M. R. H. Ranger, sixth grade, Puthur range, to charge of Kasargode range, South Mangalore division.

December 4, 1917.

Under article 260 of the Civil Service Regulations, the privilege leave for two months and twenty days granted to Muhammed Habib-ul-lah Sahib Bahadur, Extra Assistant Conservator of Forests is extended by one day.

M. R. Ry., Vallore Raman Menon Avergal, Extra Deputy conservator of Forests on leave, to be District Forest Officer, Guntur, on return from leave.

M. R. Ry., Muthuswami Ayyar Panchapakesa Ayyar Avl., District Forest Officer, Guntur, to be District Forest Officer Trichinopoly, on relief by M. R. Ry., V. Raman Menon Avergal.

M. R. Ry., S. Ramachandra Ayyar, M. R. Hons. Ranger, fourth grade, in charge of Muddanur range, is appointed on special duty to be in charge of hay operations to work directly under the orders of the District Forest Officer, West Cuddapah.

M. R. Ry., D. Venkatramana Ayyar, Ranger, first grade, in charge of Cuddapah range to be in charge of Muddanur range in addition to his own during the absence of No. (1) on other duty or until further orders. He will relieve No. (1) forthwith.

December 11, 1917.

Under article 260 of the Civil Service Regulations Mr. W. H. Woodhouse Adolphus; Extra Assistant Conservator of Forests, is granted privilege leave for two months with effect from date of relief.

The three week's leave without allowances granted to. Mr. A. W. Lushington, C. I. E., temporary Assistant to the Forest Commissioner, is cancelled.

M. R. Ry., Muthuswami Ayyar Panchapkesa Ayyar Avergal District Forest officer, Guntur to be District Forest officer South Arcot *cum* Tanjore, on relief by M. R. Ry., V. Raman Menon Avergal (This canecls notification No. 496 dated 28th November 1917 published on page 1355 of part 1 of the Fort St. George Gazette dated 4th December 1917).

M. R. Ry., K. A. Chengappa Avergal, District Forest officer South Arcot *cum* Tanjore, to be District Forest officer Vellore (West) on relief by M. R. Ry., M. Panchapakesa Ayyar Avargal.

M. R. Ry., George Venugopal Avargal, District Forest officer, Vellore (West) to be District Forest officer, Trichinopoly, on relief by M. R. Ry., K. A. Chengappa Avargal.

Mr. M. C. Chandy is confirmed as Extra Assistant Conservator of Forests with effect from 1st November 1917.

On return from leave M. R. Ry., C. Rajagopala Nayudu, Ranger second grade, is transferred from the South Vellore division to South Arcot for the charge of Tirukkoyilur Range.

M. R. Ry., M. Ambu, M. R. H. Ranger on Working Plan duty, is granted privilege leave under article 260 of the Civil Service regulations for three weeks from 6th November 1917.

December 18, 1917.

Mr, T. Clear, Deputy Conservator of Forests and District Forest officer, Kurnool West, to be on special duty in connexion with the supply of fodder to the Miltary Department with effect from 31st October 1917.

Consequent on the deputaton of Mr. E. W. Fernandez, M. R. H. Ranger, fifth grade, in charge of Kanigiri range, Nellore district, to put in his drills under Indian Defence Force Act at Bezwada, the following posting is ordered :—

Mr. D. E. Lewin, Ranger, sixth grade, working in South Cuddapah is transferred and posted to the charge of Kanigiri Range. He should join forthwith and relieve Mr. E. W. Fernandz.

M. R. Ry., A. Ranganayakulu Ranger, fourth grade, in charge of Sanipaya Range, West Cuddapah District, is appointed as Senior Instructor of the Vernacular Training School of the Central Circle for the 1918 session to be held in the same district.

(2) Kuttappan Pillai, probationary Deputy Ranger, third grade, North Cuddapah is appointed to act as Deputy Ranger, first grade and is posted as Assistant Instructor, Vernacular Training School, Session of 1918. To join immediately on relief in time to open the school on 1st February 1918.

(3) P. M. Mathew, M. R. H. and probationary Deputy Ranger, first grade, South Cuddapah district, is appointed as Ranger, sixth grade, on probation for six months vice Ranger S. A. Ramakrishna Nayadu dismissed and is posted to the charge of Sanipaya Range and to relieve No. (1) immediately after the Christmas holidays.

(4) K. S. Raghavachari, M. R. H. is appointed to act as Ranger, sixth grade, vice No. (1) on other duty as Senior Instructor or until further orders and is posted to the charge of Muddanur range, West Cuddapah district.

The unexpired portion of the two days' privelege leave granted to Mr. D. E. Lewin M. R. H. Ranger, sixth grade, on special duty Kodur Range, South Cuddapah District granted in this office Service Order No. 174, dated 17th November 1917, is cancelled.

M. R. Ry. S. Ramaswami Ayyar, Ranger, first grade is posted for the charge of the Rajahmundry range in addition to his charge to relieve Ranger V. S. Subramaniya Ayyar appointed as Special Forest Officer, Golgonda and Hill Madgole.

M. R. Ry. S. Jothinayagam, M. R. H. Ranger, fifth grade, on expiry of the leave granted to him is posted to the Gokavaram range of Lower Godavari.

(1) M. R. Ry. A. K. Kandan M. R. H. Ranger, fifth grade, South Vellore division is granted privilege leave for one month from 10th January 1918.

(2) M. R. Ry. G. N. Subba Rao, probationary Ranger sixth grade, is posted to the charge of Polur range during the absence of No. 1.

December 29, 1917.

In modification of notification No. 470 dated 16th November 1917 published in Fort St. George Gazette dated 20th November 1917, Mr. D. L. Sathe, District Forest Officer. Chittoor (now on leave) is posted to be District Forest Officer, Nellore, on relief by Mr. C. E. C. Fischer.

1. M. R. Ry., C. Rajagopal Nayudu, Ranger, Second grade, is transferred from South Arcot district to North Salem Division for the charge of Dharmapuri range.

2. Mr. B. R. Salisbury Ranger, third grade, is on relief No. (1) appointed as Instructor Vernacular Training School to be held in South Vellore Division.

January 8, 1918.

On expiry of the leave for six months (i. e. 29th December 1917) Ranger B. V. Jogeswara Rao is posted to Kurnool East for the charge of Morricheruvu range.

On expiry of the privilege leave for three months (i. e. on 1st February 1918) Ranger N. S. Anata Acharlu is transferred to Ganjam for the charge of the Surada range.

C. Narayanan Ranger third grade Kollegal Range is appointed Instructor Vernacular Training School, Nilgiris with effect from the 16th January 1918.

V. G. Appadurai, Deputy Ranger, third grade, South Coimbatore is transferred to Kollegal range. To proceed at once and relieve Ranger C. Narayanan. V. G. Appadurai to act as Ranger sixth grade temporarily.

The following candidates have passed the departmental test held in July 1917 :—

Forest Code and accounts.

V. B. Parameswara Ayyar, Accountant, Collector's Office, Coimbatere—first class.

D. T. Padbhanaba Ayyar, Accountant, Collector's office, Coimbatore—second class.

January 15, 1918.

Under article 260 of the civil Service Regulations, M. R. Ry., M. R. Sundaram Ayyar Avergal, Extra Assistant Conservator of Forests, is granted privilege leave for two months and seven days from or after the 13th January 1918.

Mr. A. A. F. Minchin, Deputy Conservator of Forests, is, on the termination of his special duty, posted as District Forest Officer Ganjam.

The appointment of K. S. Raghavachari, M. R. H. to act as Ranger, sixth grade vice M. R. Ry., A. Ranganayakalu, Ranger, fourth grade, on other duty as Senior Instructor of the Vernacular Training School, 1918, ordered No. 187 of 17, dated 11th December 1917, is cancelled.

Mr. D. E. Lewin, M. R. H. Ranger, sixth grade, in charge of Kanigiri Range, Nellore district, on relief by Mr. E. W. Fernandez, M. R. H. Ranger fifth grade, is posted to the charge of Muddanur range, West Cuddapah district.

M. R. Ry., T. M. Duraiswami Pillai, Head clerk, District Forest Office, Chinglepet district on Rs. 40—2—50, appointed to act as Ranger, sixth grade on probation for six months in this Office Service Order No. 104 of 17, dated 5th July 1917, and now in charge of Udayagiri range will continue to act as Ranger sixth grade on probation, vice Mr. C. Mahony, Ranger, second grade, sub-protem, on other duty.

M. R. Ry., V. D. Ramalingam Pillai, M. R. H. Ranger, sixth grade, North Vellore Division, is granted privilege leave for one week from 3rd January 1918 in continuation of the Christmas holidays.

January 22, 1918.

M. R. Ry., R. Viraswami Nayudu, Ranger, fourth grade, is posted to the Ganjam district on expiry of the leave granted to him.

January 29, 1918.

Deputy Rangers K. Tiruvenkata Achari M. R. L. and S. A. Dawson, M. R. L. are promoted to act as Rangers, sixth grade, vice Rangers V. S. Subramanya Ayyar promoted as Special Forest Officer, Golgonda Agency and Hill Madgole, and R. P. Jeevappa Nayak, granted furlough with effect from date of reversion.

February, 5, 1918.

The unexpired portion of a day's privilege leave granted to M. R. Ry., S. Chidambara Ayyar, M. R. H. Ranger, fifth grade, in charge of Rapur Range, Nellore district in this Office Service Order No. 139, dated 17th September 1916, is cancelled.

(1) M. R. Ry., N. Sunderesa Ayyar, Ranger, fourth grade, is transferred to Kurnool West for the charge of Barluty Range. He should be relieved at once to join expeditiously.

(2) M. R. Ry., M. Krishna Rao, M. R. H. Ranger, fifth grade, is on relief by No. (1) transferred to Kurnool East, for the charge of Dornal Range.

Mr. R. E. Lemos, M. R. Hons Ranger, third grade, is granted privilege leave for one month from 11th January 1918.

P. A. Krishnaswami Mudaliyar, M. R. H. Deputy Ranger, second grade, and G. Devanayagam Naidu, Deputy Ranger, first grade, and acting Rangers, sixth grade are confirmed as Rangers sixth grade with effect from 1st February 1918.

(1) M. R. Ry., N. Swaminatha Ayyar, Ranger, second grade, from Bhavani to Bargur Range North Coimbatore Division,

(2) B. S. Ramaswami Ayyar, Ranger, sixth grade, from Bargur to Bhavani Range North Division.

February 12, 1918.

Under article 260 of the Civil Service Regulations. Mr. H. B. Bryant, Conservator of Forests, Central Circle, is granted privilege leave for forty days from 3rd April 1918 with permission to prefix the Easter holidays to the leave provided the conditions of article 220 of the C. S. R are fulfilled.

February 19, 1918.

Mr. Hugo Francis Andrew Wood, Deputy Conservator of Forests and District Forest Officer, South Coimbatore, *to act* as Conservator of Forests, third grade, and to be in charge of the Central circle, during the absence on leave of Mr. H. B. Bryant or until further orders.

The privilege leave for one month from 11th January 1918 granted to Mr. R. E. Lemos, M. R. Hons, Ranger, third grade, in this office, Service Order No. 10 of 1918, dated 25th January 1918, is extended by fifteen days. The existing arrangements will continue.

Mr. B. K. Taylor, B. A., is appointed acting ranger, sixth grade, and is posted to Tinnevelly for training under District Forest Officer at Tinnevelly.

M. R. Ry. Krishnan Avargal, Probationary Extra Assistant Conservator of Forests is transferred from Tinnevelly to North Salem.

M. R. Ry. K. R. Krishnan Nayar, Ranger fourth grade, the Nilgiris, is granted privilege leave under article 260 of the Civil Service Regulations for two months from date of relief.

February 26, 1918.

M. R. Ry. V. N. Seshagiri Rao, Ranger, second grade, to be Extra Assistant Conservator of Forests on probation for two years.

Consequent on the retirement of second grade Ranger M. R Ry. K. Ramaswami Ayyar, the following promotions are made in the class of Rangers with effect from 1st February 1918.

(1) Mr. M. E. Dawson, from second grade sub-pro-tem to second grade permanent.

(2) M. R. Ry. H. Rama Rao from third grade permanent to second grade sub-pro-tem.

(3) M. R. Ry. M. Kuppuswami Nayudu, from third grade sub-protem to third grade permanent.

(4) M. R. Ry., R. Manikkam, from fourth grade permanent to third grade sub-pro-tem.

(5) M. R. Ry., C. Srinivasa Rao, from fourth grade sub-protem to fourth grade permanent, but to be on probation for one

year from the date of his passing out of the College. This promotion is subject to his securing at least a Higher Standard certificate at the College.

S. Venkataswami Nayudu, Deputy Ranger, first grade, is appointed to act as temporary Ranger, sixth grade, from the date he reports himself for duty before the Special Working-Plans Officer, Tinnevelly.

A. Kadir Badsha, Deputy Ranger, second grade and temporary Deputy Ranger, first grade, North Malabar, is appointed temporary Ranger, sixth grade, and posted as Assistant Instructor, Vernacular Training School, Mudumalai, Nilgiri district.

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F. Cowley-Brown.
Principal.